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VOLUME VII

# The A·T·A· Magazine

NUMBER 2

OFFICIAL ORGAN OF THE ALBERTA TEACHERS' ALLIANCE, INC.

MAGISTRI NEQUE SERVI

JULY-AUGUST, 1926

A.E.A. CONVENTION ADDRESSES

## Education and Taste in Reading

EXPENDITURE on education does not produce its full results immediately. Some of its effects are apparent almost at once, but the greater part do not accrue until after the lapse of many years or even of generations. One of the more tardy, and at the same time more significant, results of the past half-century of work of the schools is that which is made evident by the recent report of the Carnegie Trust. It is gratifying to workers in education to hear that there is an improvement in the quality of the books read by the public. The improvement is gradual, but that is only to be expected; a sudden improvement, indeed, would be suspect. We are accustomed to hear of "gradual improvements" in habits, customs, manners and dress of the people as the result of education; and we frequently note in these columns the improvement in the morals of the people which has followed upon the introduction of universal compulsory education. The elevation in the standard of reading is one of the most gratifying tendencies of the times. If it continues, and we feel confident that it will, especially in view of the improved methods of teaching, reading and literature now being adopted in the schools, its reactions will be enormously to the good in every department of national life—from the tone of Parliamentary debates to the quality of films in the back-street picture theatre, and from the standard of the work done in industry to the quality of the amusements which occupy the leisure time of the people.

—*Schoolmaster*

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MANAGING EDITOR: John W. Barnett, Edmonton.

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VOL. VII. EDMONTON, JULY-AUGUST, 1926 No. 2


## Editorial


**BLAIRMORE SCHOOL BOARD**
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**WAINWRIGHT S.D. No. 1658**
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JOHN W. BARNETT,
General Secretary-Treasurer,
Alberta Teachers' Alliance,
Imperial Bank Bldg., Edmonton.


SHOULD the Alberta Teachers' Alliance assume the responsibility of taking over the work of the Alberta Educational Association? For a number of years past, the wisdom of holding a dual convention during Easter week has been questioned by Alberta teachers. The members of the A.E.A. are to a great extent members of the A.T.A. also, and it has occurred to many that considerable economy would result from an amalgamation of effort during Easter week.

* * * *

AMALGAMATION of efforts does not suggest the doing away with the inspirational nature of the A.E.A. Convention and the substitution therefor of business meetings for the discussion of A.T.A. problems; rather does it mean that the teachers of the Province would depend upon one Executive to plan the whole Convention—arrange for the business sessions of the A.T.A. altogether separate and apart from the inspirational meetings; contract for the prominent speaker or speakers to be with us just the same, and have sectional meetings as at present.

THE teachers of Alberta must needs support two executives at the present time with the attendant expense of paying the transportation expenses of members to and from the meeting place. Although there is no rivalry between these two executives, nor has there ever been such, still it is not considered possible by many teachers for the two bodies to do otherwise, unless joint meetings of the executives be held, than frequently find after all arrangements have been made with the very best intentions, that the programmes of the two bodies do not dovetail. If it be necessary to hold joint meetings of the two bodies to obviate all chance of arrangements clashing, it amounts in effect to one body doing the work, which body is practically twice as large as either executive is at present.

* * * *

SUPPORTERS of the amalgamation idea are confident that one Executive could plan more efficiently than one for both departments of the Convention and, as above suggested, save the members of both bodies considerable expense. The A.T.A. bears a large portion of the cost for the Convention hall. In its final analysis this means that members of the Alberta Educational Association who are members of the Alliance pay their share through the membership fee of the A.E.A. and, then again, pay further through their A.T.A. funds.

* * * *

THE Alberta Educational Association has no connection whatever with the Fall Conventions which meet at different times and in different places throughout the Province; it is not a clearing house for opinions of teachers who meet in bodies from time to time for the purpose of discussing educational problems. Therefore, it occurs to many that, since the A.T.A. provides facilities for crystalizing the opinions of groups of teachers throughout the province, that organization could plan more efficiently to enable such matters as are live issues amongst the teachers to be on the program for discussion at the Annual Convention.

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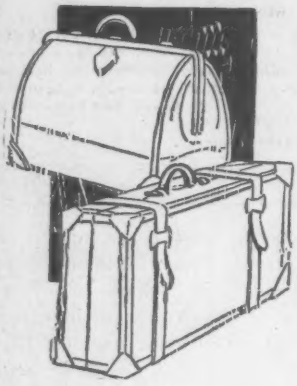

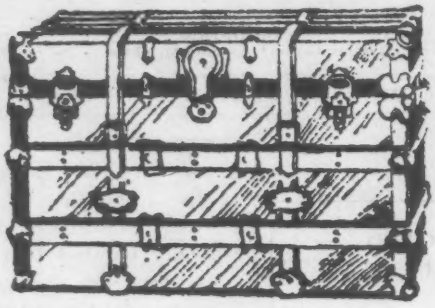

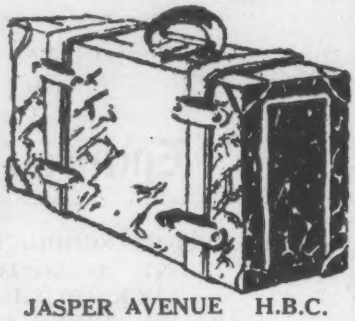

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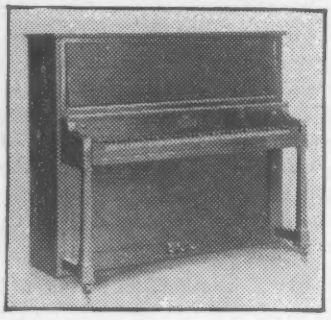

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*"I saw your name in the A.T.A."*

BEFORE the A.T.A. could take over the work of organizing and carrying on the work now done by the A.E.A. it would be necessary for us to broaden our constitution somewhat; it would be necessary to provide for associate membership. All persons interested in education—teachers as well as Departmental officials, inspectors and laymen—should be eligible to become associate members by payment of the Convention fee. In British Columbia where the B.C. Teachers' Federation takes over the whole of the annual Easter convention, all teachers whether or not active members of their professional provincial organization, are able to obtain full rights and privileges to speak and vote on all matters brought before the full convention. Furthermore, the Minister of Education, Departmental officials, inspectors and other citizens interested in education may and do become associate members of the B.C. Teachers' Federation.

* * * *

BESIDES providing facilities for everybody interested in education to take part in the Annual Convention, organized by a single executive body, it furnishes an excellent opportunity for the various divisions or sections of the teachers' organization to exercise their influence as a section. For example, the High School section meets and deals with purely High School matters, especially the curriculum, thereby avoiding what some consider is a grievance—the inability of special groups within the organization to pass upon matters directly and distinctly concerning their own particular group without being dependent upon the support of delegates representing other groups or sections of the body whose interests are in no way connected with the questions. The experience of the B.C. Teachers' Federation is of profit to Alberta and the Dominion lead given by the B.C. teachers in respect to having the large provincial educational convention organized by the Provincial Federation is well worthy of imitation.

* * * *

BESIDES being a benefit purely from an organization standpoint, it might possibly so work out that the active members of the A.T.A. would be saved the $1.00 fee paid now as membership fee to the Alberta Educational Association; that is to say, the membership fee paid to the Alliance would cover also the convention fee and the only persons required to pay at the convention would be those who are not active members of the Alliance—the associate members.

* * * *

IN accordance with a resolution passed at the last Annual General Meeting of the A.T.A., that steps be taken to assume the work and duties of the A.E.A?, the Executive of the A.T.A. will be called upon to discuss this matter thoroughly within the next few months. The A.T.A. is concerned only with giving good service to the teaching profession and to the cause of education. In order to give good service to the teaching profession it is necessary that whatever policy is adopted meets with the overwhelming approval of those whom we desire to serve. Therefore, the Executive is anxious to give all teachers an opportunity of expressing their views on this important matter and teachers and all other iducationists are invited to express their opinions on the matter in the *A.T.A. Magazine*. During the next few issues it is our intention to publish a symposium on "Should the A.T.A. amalgamate with the A.E.A.?" and contributions from all interested will be welcomed.

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ONCE again it is necessary to warn our members that they communicate with Head Office before committing themselves when difficulties arise. During the past few weeks several cases have been brought to notice where teachers acting in accordance with their own best judgment have seriously prejudiced their interests and the interests of their fellow teachers by publishing statements in the local press in reply to contentions of the school board, or by resigning when requested to do so by the school board. Whenever a difficulty arises the best legal advice is available to our members for the asking, so why run the risk of experiencing painful afterthoughts or useless regrets.

* * * *

SOME weeks ago, the statement of a teacher which had been published in a local newspaper was brought to the notice of the court when a claim for unpaid salary was being heard. The court admitted the statement as evidence against the teacher claimant, much against the desire of our Solicitor and it may be that the unwise act of the teacher, committed in good faith, will materially affect the decision. In another difficulty, two teachers were both asked to resign by the school board. One teacher resigned and the other decided to get advice from the A.T.A. before making any decision. After investigation, it was proven to be a most unjust act on the part of the school board to "fire" the teachers. Both had proven themselves to be highly efficient, particularly hardworking and self-sacrificing in the interests of their pupils and the school. Absolutely nothing beyond the complaint of one daughter of one of the trustees that the teacher did not give her sufficient help to understand thoroughly her arithmetic was alleged against the efficiency of one teacher, and in the other case the board thought that the teacher had worked so hard that he had undermined his health and so made him irritable and less efficient in school than would have been the case had he been less interested and hard working. True, the teachers had had a "tiff" months ago over a matter of discipline and this was brought to the notice of the board. Everything had been running smoothly since; nevertheless the board decided upon "having a change." The teacher who decided not to relieve the board of the responsibility of terminating his agreement encountered much displeasure thereby; the other teacher had resigned thereby giving rise to expressions of great satisfaction. Had no action been taken by the one teacher it would have been an excellent case to lay before the Board of Reference with a view to reinstatement: it would undoubtedly have been a simple matter to show how petty, autocratic, unwarranted and arbitrary the school

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*—The Financial Times, Montreal.*

The Commercial Life Assurance Company, with head office in Edmonton, Alberta, continues to make satisfactory progress, under the management of Mr. J. W. Glenwright.

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*—The Monetary Times, Toronto.*

This progressive western company, that has during the past year shown such remarkable progress, has for 1925, in assets, premium income, interest earned and in all the other substantial features of a life insurance company's report, made the greatest gains of its entire history.

*—Calgary Albertan.*

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*—Edmonton Journal.*

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*—Financial Post, Toronto.*

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*—Saskatoon Daily Star.*

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*—MacLean's Magazine.*

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*—Vancouver Sun.*

COMMERCIAL LIFE ASSURANCE COMPANY

board had shown themselves. But, in view of the resignation nothing could be done for one teacher and it makes the situation with regard to the other more difficult of approach. When in difficulty and doubt, ask advice!

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IT will not surprise the rural teachers to learn that the unpaid taxes problem and, consequently, the unpaid salary problem does not seem to be mitigated even though last year's was a bumper crop and though farmers throughout the Province are in much better financial condition. Dozens of cases arise every year where everything points to the fact that there is no excuse for the teachers being driven into a condition of positive penury through callousness on the part of the school board and apathy on the part of the taxpayers. This is evidenced by the fact that practically all the school boards on receipt of an ultimatum from the Alliance to forward within ten days a substantial sum on account of unpaid salary or be sued, almost without exception "come across" within the specified time. The way the finances of many of the rural school districts are dealt with is a scandal. Many of our brightest teachers decide to leave teaching for this reason alone and enter some other calling where they can be sure of receiving wages on time.

* * * *

THERE seems to be a tendency to take it for granted that the teacher can exist for months on "air," and woe be to the teacher who has the temerity to disillusion the school board that such is not possible and who informs them that the School Act states that one of the "Duties" of trustees is to "provide for the payment of teachers' salaries at least once each month." The teacher might just as well ask to be "fired" as be what the school board considers unduly anxious and importunate in requesting payment of overdue salary. A glaring instance of offence was given to a school board some weeks ago when the teacher, after making a practical request for the balance due to him, or at least something on account, was asked by the secretary-treasurer: "Is drawing your cheque all there is to teaching?" And, forthwith, complaints galore commence to pour in, ratepayers begin to "kick," parents begin to transmit to the receptive ears of the board the complaints of pupils that "That teacher don't learn us nothing." A meeting of the board is called and the usual "poppy-cock" is "spilled." The board thinks that it would be better to have a change; the ratepayers, parents and pupils are kicking; the teacher has an unfortunate manner with the pupils; nothing can be said against the teacher's high standard of education, but it seems he is not good at imparting knowledge to the pupils: everything but the real reason is given, which real reason is, the teacher wants the board to wipe out their indebtedness to him, so if the board desires to be in "easy street" financially and the ratepayers free from pressure, this teacher must go and another be appointed who will be prepared to wait for his salary. Of course, the new teacher does not find out that this is a requirement of continued service with the board; he must come into the district and find out by experience that he must wait for his salary.

* * * *

IT occurs to us that a school district with delinquent taxpayers who can not obtain credit from the bank to pay the teacher should not be allowed to employ a teacher until their financial position warrants their so doing. However, credit with the bank will not entirely solve this difficulty, for a school board must pay eight per cent. interest to the bank and the teacher, usually no Shylock, often does not press for interest. Furthermore, the teacher can claim only five per cent. interest on overdue salary which is three per cent. less than the rate charged by the bank.

## Second Reader

By Wilfred Wees, B.A.

*A Code of Ethics.*—An exchange carries the following abridged treatise on morality on its cover page and calls it "A Code of Ethics." "As members of our democracy, teachers should take their place as moulders of public opinion. As good citizens, they should interest themselves in all movements for public betterment, and take a leading part in all activities for child welfare. As professionally trained educators, they should . . .umptiddly-um-tum . . . etc., etc. Finally, they should comport themselves always in such a manner as to conform to the highest recognized standards of social and moral conduct and should use every honorable means to uphold the dignity and honor of their vocation, to exalt its standards and extend its sphere of usefulness."

And it had to be expurgated at that. If the patriarch whose cerebral excretions coagulated into the well-rounded phrases of such a flagrant debauch of the ancient and honorable term "Ethics" could exude for an hour from his sand-dune, he'd find his fellow "members of our democracy" in rather serious dispute as to the type of mould which should be prepared to receive the molten opinion of the public. Some of his "good citizens" would be finding the road to "public betterment" lying in the direction of the provincial government's joy-shops, and some would be raising appropriately pious eye-brows toward the land of eternal drought. And "whom shall we have for nuts in May" to judge these highly-touted "recognized standards of social and moral conduct?" Some recognize and some don't.

When society learns to let the teacher live the life of an ordinary human animal with the rest of the herd, and forces him to take only the consequences pertinent to the act, reputable or disreputable as the case may be, and ceases the attempt to inspire him with missionary zeal for the benighted children of golfing mothers or New Canadian fathers, then . . . , well, then, . . . can you imagine it? A code of ethics that is worthy of the name may be found in the words of Sir Robert Falconer in the same magazine: "*To raise by all legitimate means the standard of teaching and the qualifications of teachers.*" If he has the brains of even an M.L.A. either teacher or layman can attach some significance to the latter statement of the professional objective.

* * * *

*Pledge of the A.F.T.*—"The teacher should be well trained and look upon teaching as a profession. He should be treated with respect as an expert in his line.

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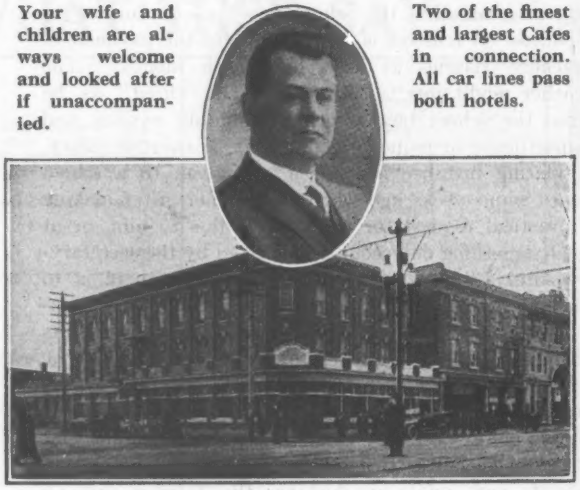

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Every opportunity should be open for identification with the life of the community and contact with the adults as well as the children. Every incentive should be offered for professional improvement. He should participate in the administration of the schools by contributing from his training, experience and ideas, in the determination of educational policies and practices. He should be encouraged to co-operate with fellow-teachers to increase the value of all, giving support and assistance where needed and sharing the responsibility when the unfit are identified. He should be permitted to share in the determination of teaching conditions, joining his voice with others through a voluntary organization. He should above all else have a feeling of security in his position, if effective and faithful, giving of his energy to his work rather than to efforts to retain his job. Interest in the work, in the school, in the children, and the homes they represent, and in the community, will make the teacher infinitely more valuable and will convert him from an itinerant into a citizen. But without tenure, all else is doomed to failure."

—*American Federation of Teachers.*

* * * *

"*All Change.*"—And don't forget your parcels. The transmigration of souls is no mystic's hope of heaven in Alberta in July and August, though due no doubt to the fictive fame of a flowing fount of future fortune. It's July and August the rainbows arch the teachers' heavens and all begins the scrambling pilgrim's hectic flight to the gold-filled bucket at the rainbow's end. Peculiar, too, that each one grabs the bucket that another left. And all for a price. "The teachers see the country, the public saves its money, the children in a fashion survive the inhuman ordeal, and the great public school system somehow holds together."

The effort of the Alliance Executive to bring some kind of system out of the chaotic scramble for schools every summer is a laudable attempt to reduce to a minimum the loss in salary status that has been the inevitable result. Co-operation by every teacher will prosper the undertaking. But it is doubtful if anything can be done to obviate the loss that the profession suffers in lessened respect of the communities. The American Federation of Teachers has something to say in this regard: "Contracts between teachers and public are a gradually decreasing factor. Official opinion supersedes all else. Teachers are hired, rehired or not rehired without representation. Only in the larger cities is there collective bargaining. The factory system is copied closely. It follows logically that the teachers' social status, broadly speaking, is very low. They can be hired and fired as easily as any kind of workers. And no one respects any group whose conditions are so easily, so arbitrarily determined."

* * * *

*Sanctimonious.*—Of the Rev John Roach Straton, the *Quill*, official organ of Greenwich Village, New-York-on-the-Slum, a magazine for amateurs, edited by Bobby Edwards (scant relation to him of the *Eye-Opener*), bard, historian and prophet of the Village, said: "Somehow I have a feeling that if Dr. Straton were to preach a jeremiad on the awfulness of young girls chewing tobacco, every flapper in town would try it just once. Such is the power of the pulpit. We sin to please our preachers."

* * * *

"*The Drifter.*"—Sometime I'd like to see the Drifter. When that post-historic magazine, *The Nation* of New York, is particularly ultra-socialistic or unusually caustic, and makes you feel like you'd like to bite the ear off the editor, the Drifter comes along with the column and a half of kindly tolerance to smooth a ruffled soul. It's always been a mystery to me how he can maintain sanity in the midst of such vituperance. Probably those teachers who have remained virile after after forty years of playing and working with children have a similar sort of mental gyroscope. It must take an immense amount of steadiness to maintain the mean when working with either extreme.

## Teachers Desiring Positions—Attention!

According to returns to date, received in reply to a questionnaire sent out by the Alliance, and from information received by the Department which, for its own guidance is obtaining information with respect to the number of teachers which will be required to fill vacant classrooms after midsummer, it is safe to predict that approximately one seventh of the 4,900 teachers now serving will leave the profession in Alberta at the close of the present term. Returns are not yet all to hand, but it is not likely that the balance to be received will materially affect the forecast.

In addition to the 700 teachers who definitely know now that they are leaving us, the large cities are estimating a number of additional classrooms for the fall term to take care of the normal increase in enrolment. Edmonton plans seven new rooms in the public schools alone, and Calgary, six. In the smaller cities and in the towns and villages also similar provision for extra rooms and therefore extra teachers is now being made and all these additions will help to swell the number of new teachers required.

Approximately 750 students attended normal school up to the end of the term and wrote on the final examinations; of these, probably 730 will receive certificates entitling them to teach.

It is reasonable to assume that a proportion of teachers who, at the time of replying to the questionnaire, were not in a position to state positively whether or not they expected to teach; others whose plans have changed since replying and will not be on deck when the schools re-open. All these teachers would naturally reply "Yes!" to the question: "Is it your intention to teach in Alberta during the school year commencing July 1st, 1926. Also, there are a number of teachers who commenced to teach after Varsity closed in April who will vacate their school and return to college in October—probably a round 100, although neither Department nor University Authorities are able to supply us with statistics analyzing the position with respect to supply and demand of teachers, the following estimates would appear reasonable:

### VACANCIES

| | |
|---|---|
| Proportion of teachers now engaged who replied "No!" to the question: "Is it your intention to teach in Alberta during the school year commencing, July 1st, 1926?" | 700 |
| University students now teaching who will return to Varsity in October | 100 |
| Additional rooms in cities, towns and villages required for the re-opening of schools in September | 30 |
| New rural schools to open for the Fall term | 25 |
| Teachers other than university students whose plans to teach have changed since replying to the questionnaire | 20 |
| Total | 875 |

| | |
|---|---|
| Approximate number of new teachers required by September | 775 |
| Approximate number additional (university students) who will vacate schools by October 1st | 100 |
| Total by October 1st | 875 |

**SOURCES OF SUPPLY OF NEW TEACHERS**

| | |
|---|---|
| Recent graduates of Normal School who desire or will be eligible to teach next year | 740 |
| Teachers from other Provinces | 25 |
| Total | 765 |

N.B.—It may be that a number, holding Alberta Certificates—married women and others now taking a rest from teaching—will return, but with prospects of a splendid crop and consequent anticipated improving economic position of farmers, fewer farmers' wives than last year will be likely to swell the teacher supply next year; therefore this item may not seriously be considered likely to affect seriously the estimate.

The above estimates, although only approximate, are the result of honest, sane and carefully considered judgment and study on the part of those in the best position to secure all available information and sift it. It looks, therefore, as if Alberta teachers are once more in a position to exercise their bargaining power with school boards in regard to salary. Normal School graduates may take heart and hold rigidly to the $1,000 agreed upon. Faith, confidence, loyalty to their pledge and solidarity, are all that are now required to ensure a successful outcome of their efforts to maintain the status of the profession they are now entering.

Underbidding, through fear of being without a position, with its consequent lowering of status and loss of respect from the public, is now not only unnecessary, but at the same time unwise, even suicidal. The $1,000 minimum salary for recent Normal School graduates is a fair and reasonable object. Teachers who are not able to give $1,000 value should not be in possession of a certificate of qualification and teachers with experience should surely ask for and obtain an advance in salary beyond what is being paid to "green" graduates.

# Teaching in the New Humanism

By Dr. R. W. Boyle

THE New Humanism is becoming a common enough term now, but I am concerned with the character it should contain.

What would be a satisfying humanism?

A sense and practical operation of true Justice; a love of Truth and Beauty; an idealism, intellectually defensible in religion; a fairness in politics; a mentality to interpret the happenings of the past and to peer forward into the future; an avidity for new knowledge and discovery and their beneficial application; a self-respect and dignity in labour; a sympathy and respect for others; a free path for the talents of the capable.

Certainly if we had all that it would be new!

When mention is made of humanism in education—invariably there comes to mind either the classic humanism of the great Greeks of old, or the humanism of the phenomenal re-birth of the human spirit known as the Renaissance. It is not so well known that our modern science is itself a product of this intellectual re-birth. We date it from about 400 years ago—its first great figure being Leonardo da Vinci. Discovery has been accelerating since—so that now it literally is true that every half-century sees more new knowledge discovered, digested, and applied than in all the centuries previous. Its findings constitute now the greatest revelation yet revealed to man. Never before had man the opportunity to know himself so well; never before could be hold such control in the direction of his own development; never could he move about or communicate so well with his fellow creatures; never could he command such aid from natural materials and forces; and never has he lived in so small and understandable a world. Freedom of movement, freedom of life have never before been so advantageously promoted. Yet every one of these great consequences can be turned into a monstrous evil—if there be not mind and character to control them.

These results are new—classical antiquity no more than guessed and philosophised about them; the Renaissance tilled the soil which later produced them—and no future Humanism can ever be without them—if it is to succeed.

My thought today is the thesis of the Belgian poet, Maeterlinck, that the results of modern science veritably constitute a New Revelation, as valid and as beneficial as the revelations of religion, philosophy and law, of old. Remnants of these revelations to former peoples—Chaldean, Egyptians, Hebrews, Greeks and Romans—have come down to us, and from them are living practices which benefit us still. Great names like Homer, Socrates, Plato, Aristotle, Hippocrates, Democritus yet inspire and kindle our best aspirations. But with all due veneration and respect to the classics and to classical antiquity, it would be useless if we attempted on their stock of knowledge, their methods, their philosophy, their religion and their mentality, to secure the foundations of our modern society. They can offer us the record of their experience, but in th last few hundred years something *positively new* has been revealed unto the world and must forever be taken into account.

Says the Rev. Dean Inge (The Social Message of the Modern Church), *Yale Review—Science*—March 12th, 1926:

"I believe that in science has come the chief revelation of the will and purposes of God that has been made to our generation. It is more important for the Christian preacher to understand this new revelation, and to apply it to his ethical teaching than to cultivate a sympathy with social revolution and the "demands" of manual labour. Perhaps the great struggle of the future will be between science and sentimentalism, and it is by no means certain that the right side will win. There are many temptations to the church to side with the anti-scientific forces. There has been and still is a conflict between traditional authority and natural science. Science and philosophy are willing to learn from each other and a rapprochement is in sight. . . . We have to come to terms with the scientific view of the world. There is no reason why this old feud should be perpetual. Christ never wished to oblige us to outrage our scientific conscience as a condition of being His disciples. Our traditionalists find heavy burdens, griev-

ous to be borne, and lay them on men's shoulders; burdens which are no part of the burden of the Cross, no part of the light and easy yoke which Christ told us to take upon us, but which on the contrary are a terrible impediment to thousands who wish to be Christ's followers, but cannot swear black to be white to please the authorities.

"I am afraid it is not so much any particular result to science as the whole scientific way of approaching questions, which is hateful to traditionalism. I beg those of my readers who are religious teachers to try to keep an open mind, and at least to recognize that men of science are sincerely anxious to make their contribution to the problems of civilizations, that they have a strong case, and that their motives are as pure as your own.

I believe, therefore, that in as far as we connect the kingdom of God with the progress of the human race, we who are Christian ministers ought to give much more attention than we have hitherto done to the discoveries of modern science, and to the scientific way of looking at things. . . . . I also hold very strongly that a reconciliation between religion, science and humanism is overdue."

It is not necessary to rhapsodize on the transformation of our civilization by scientific invention and discovery. The world acclaims the practical gifts of science, and there is no complaint by scientists of the public acceptance of the material benefit and comforts which inventive science may bring. But there justly is complaint that the more precious gifts of science have as yet been mostly ignored, and the influence of her spirit and her method remains mostly unfulfilled.

The unfortunate position of science is that it is comparatively unknown to the public. To them the practical applications are its only achievements. As our powers over the material resources of nature extends, applied invention achieves an importance in the eyes of the layman which no amount of unspectacular scientific thought seems to be able to accomplish. People stand in intellectual awe of it! Scientists commonly are looked upon as "visionary, abnormal men." (I wonder if this is why the present occasion is the first at which a scientific man is invited to speak at the Convention of the Alberta Educational Association.)—"Visionary, abnormal men, who spend their time in hunting up queer facts, and in dreaming fantastic dreams; as harmless creatures who putter around at things of no interest to anyone else; who, from their strange taste talk a jargon that others cannot understand, and who once in a while by pure chance stumble upon something that some more sensible and useful fellow—an inventor—is able to put to some real use."

What is Science? It is not confined to mathematics, physics, chemistry, biology, medicine and engineering. Science is the discovery and accumulation and application of *exact* information concerning the facts and laws of all nature, its forces and its creatures, including ourselves. It spares nothing, of body, mind or feeling, from its investigations; nothing is too sacred for its enquiry. The scientific method is the process by which we gain the information and correlate the facts, *i.e.*, experiment, observation, trial, and logical deduction. The distinctive quality of all this endeavor is that it *can never be final.* Scientific principles never remain satisfied, they "move on, stepping-stones of their dead selves to higher things."

The scientific and industrial revolutions of the last century have transformed completely our material culture, but our ideas on economics, politics, social life, religion and morals have altered surprisingly little since the 18th century. The up-to-date student of our social life is now convinced that the great need of the present is to adjust our postulates and interpretations in the field of social science to the same standard of reality and candour as prevails in natural science and technology. In religion and politics we have been afraid of new ideas, and have retained old and now meaningless practices. We have underestimated our own capabilities, and through that ominous, and perhaps fatal, weakness of democracy, we have satisfied ourselves with inferior social and political leaders. In consequence society has become stratified into many dissimilar and conflicting masses, and there are amongst us senses of strain and injustices and inequities.

In the jungle ignorance, self-interest and unrestrained emotion will determine conduct; and in the pack self-interest remains a compelling motive, though the beginnings of a social sense emerge to maintain the existence of the pack or tribe. Self-interest, derived from self-preservation, which is the strongest law of nature, undoubtedly has been the basis of all our progress. It was the motive of the savage when in acquiring little more of food or something else than he could see, with foresight he began a practice to accumulate a surplus. To him the surplus meant a well-fare, the origin of *wealth*, and with it he enjoyed a wealth or welfare his neighbors did not share. "Man brought nothing into the world and through long and painful ages he added little to it. A club, an axe of stone, a pebble in a sling, some skins of beasts, a rubbing of sticks for a fire. He might labour, but he only kept alive. Labour became productive only as it was guided by intelligence and a new factor, wealth, its surplus, became a new product of the human brain."

It was the existence of the surplus which made possible all refining influences and new enterprise. For with the surplus came a little leisure, a little relaxation from the constant tasks of the hunt for food. In leisure comes meditation, wonder, contemplation of nature, play; then sources of the fountains of art, literature, religion, philosophy, and science, which rose to make man more *civil*—in time to make him *civilized.* The paradox of all civilizations is that while undoubtedly it was the surplus which gave rise to all their progress—the distribution of the surplus becomes the source of nearly all their troubles! From which we can reflect on the character of man!—The same law of self-interest is responsible for both evil and good!

The practical riddle of civilization to be solved is this: How may we retain and stimulate that beneficient, enlightened, and developed self-interest, which by work, thrift, regard for others, and the cultivation of refining arts, promotes civilization and the happiness of all—and at the same time subjugate and repress the old predatory, inherited self-interest of the jungle with its ruthlessness and greed, which derives from our jungle ancestors as if it had missed the purification of man's struggle since? The former can merge into the latter, indeed often does, even in one and the same individual, or in one and the same nation. To cultivate the desire for the former while restraining the latter, and so maintain the delicate equilibrium through all life's activities, is hard; but to find the way must forever be the main purpose of a humanistic education.

It is literally true that many individuals are still in the jungle as far as life's passions and the regulation of their conduct is concerned. But since we have accepted democracy—for a time at least!—is it possible to conceive a public intelligent enough to keep itself healthy, to live and continue living sanely, to repudiate the jungle law, and to respect the rights of others? Are the mental capacity and self-restraints of the average man sufficient to make him understand and appreciate the spiritual values of science and heed its new commandments?—

I don't know! The proof has yet to be forthcoming. "It has not yet been demonstrated," says one writer, "that man can remain permanently civilized." Obviously we have the capacity for vast improvement, but in our time we have had a most convincing demonstration that the ugly proposition just mentioned may be true. "Knowledge may come," it is said, "but wisdom lingers." "Democracy may level up or level down."

In spite of our clever contrivances, our unparalleled technology and material advance in the past dozen years of our time, we have experienced the greatest warlike, economic and social upheaval and confusion yet recorded in history.

For four and one-half years a great war staggered the world. It was waged not by the uncultured, backward races, but by the most advanced nations of the earth. Land fighting wracked Europe, Asia Minor, Egypt, Mesopotamia, West Africa, East Africa and China—*i.e.* war visited simultaneously all the continents except this one. In the same period revolutions broke out in Russia, Mexico and China. Sea fighting and the destructions of ordinary civilians and ordinary peaceful commerce, waged in the North Sea and Mediterranean, the Atlantic, Indian and South Pacific oceans. Short and distant blockading of whole nations were maintained on the sea; and bombing of cities, of ships, and of camps went on from the air. Never at any time in history has such varied and extensive war covered so much of the surface of the earth. About ten million people were killed outright, as many and a few millions more were wounded and maimed, many being incapacitated for life. Old men and old women, in the unpublished casualties, from suffering privation or sorrow had their existence snuffed our before their time; babies and young children making more unpublished casualties, died of insufficient nourishment; and some escaping actual death were set off upon a rickety, tubercular or otherwise diseased existence.

At about the end of the war a great plague broke out and swept the world. A simple plague it seemed at first, but becoming deadly, it killed remorselessly not only in the countries of the war but in all others round the world. In India alone in 12 weeks as many people were killed by plague as in the 4½ years of war. It was impossible to isolate it or stop its migrations; and it was our discovery that our physicians knew nothing whatever about it. It probably will be the case that the majority of people will have forgotten about this 'flu by the time of its next visitation.

These are the broad facts of our great war which are rapidly being forgotten. We remember the conditions in the world for a few years after the war—or do we all remember?

Dissatisfactions at the settlements, or unsettlements (?), of the great Peace Conference, racial and political jealousies between nations, the social and political unrest, led to little wars, revolutions, riots, strikes, and almost every other kind of social disturbance. Counter revolution and fighting broke out again, spasmodically; in Greece, Asia Minor, Mesopotamia, Poland, the Crimea, and Siberia; massacres took place in Syria and in Armenia. Established economic systems had of course to break down. What with the fightings, revolutions, strikes and riots people were hindered in the tasks which then could serve them best, namely the tasks of working and producing. Most nations of Europe, Africa and South America, and our country of Canada, were brought to the position of inability to pay, either by gold or by exportable goods, for their imported necessities. Outside exchange rates therefore rose against them to hinder and restrict all the more beneficient intercourse and trade. Some European nations no longer could produce the food they needed for their sustenance, and exchange rates prevented the importation of what they could not raise. Inevitably in such countries followed under-feeding, illness and much misery. You will remember that in 1920-21 many children were taken from Austria, Germany and Russia into adjoining countries to be sustained by the charity of their humane neighbours. And in this period, and possibly not dissociated from the economic influences of the great war, great famines broke out in China, in India, and later in Russia. Some millions in China in the winter of 1920-21, and perhaps a million in Russia in the winter of 1922-23, died of starvation. Plenty of others we may be sure became diseased or mentally or physically disabled, for, along with death, famine brings in its train loot, murder, prostitution and disease, and all the social ills intensified.

We who live and work just after the great war ought to understand economics from the drastic object lessons we had forced upon us. Our individual economic relationships and sense of economic values were as greatly shaken as those of an inter-national character I have just indicated. The nerve tension induced unconsciously in the stress of war began to ease when the fighting ceased. People had been fighting, working, worrying, sorrowing without cessation for 4½ years. The privations being over, men, women and children reacted, as they ever will react under similar stress, and took recourse to pleasures, sensational enjoyment, and began to spend. It might be supposed that in or after a harrowing war adult populations would give themselves over to sombre and serious reflection, to meditation and to prayer. The reverse is nearer the truth! Man flies to pleasure and sensation to slack nerve tension and suppress reflection, for man has been a pleasure lover ever since he lived in a cave. All the great cities multiplied their offerings of pleasures and sensations, many of them of a vicious sort, beyond any measure they had ever catered to before. These cities now are quieter!

Wages of the workers had been raised in the war to stimulate the war production and to keep step with the currency inflation which had progressed in its course. Manufacturers and business people of all kinds made money in this enormous production. Prices rose high, but yet the majority had money to indulge themselves, even at the high costs prevailing. Notable exceptions were the classes consisting of the more highly educated people—like teachers, clergyman, professors. During the war there necessarily had been a stoppage in production of many commodities required in peace, such as clothes, houses, vehicles and the like. With the close of the war came sudden great demand with accompanying shortness of production, which sent the prices higher. You will remember the slogan at the time was "Produce, produce!" Profiteering took place, of course, but contrary to what is generally understood, profiteering is not a cause, it is an effect. Traders cannot help enlarging profits, unless they be almost supernaturally altruistic, on a rising market in a great demand. Of course there were also consciousless traders who, catching the public in an unquestioning spending mood, profiteered deliberately. But soon at the high prices which came to prevail many of the workers could not live. Such were obliged to ask for higher wages—and others, perhaps less obliged, joined in the habit. Requests not quickly granted were met by strikes, which ended most often by part of the requested increase being given more or less willingly or forced out unwillingly. Time was lost in the strikes, which, given to production, could have assisted sooner to bring the commodity process down.

In time, however, the reckless spending ceased. People get over the mood—also they run out of money!

Inevitably the reaction to retrench begins, and people, their wants now partly satisfied, cease to buy. Meantime production has overtaken demand, deflation commences, prices begin to fall, and a new stage sets in.

All that had taken place previously and was going on in Europe and in Asia Minor had distressing consequences for us. Their hundreds of millions no longer could purchase all the materials and food they needed and formerly imported. Our agricultural products now over-stocked an unfrequented market, and agricultural prices fell to a relatively lower depth than any other commodities. It was a common saying "the bottom has gone out of agriculture,"—a sad condition for us all and not for agricultural people only. All acting causes then joined to curtail the demand for goods. Less call came on business houses, manufacturers, and the transport companies. Traders who had felt elated when the reckless spending mood prevailed, now became nervous and panicky. Obliged to reduce their output, many failed, and many suspended or partly suspended operations. Legions of workers now were thrown into partial or non-employment, wages fell; and what we call "hard times" ensued. Thus the ding-dong, see-saw economic action and reaction went on. Thus are the ways of buying and selling, employment or unemployment, high wages or low wages, or no wages at all, determined by the conditions, mentality, moods and interests of the people.

I hope we have observed it all. Is not at least one thing evident? We need to devise economic stabilisers and balance wheels—acting automatically in emergencies when the times require! Such devices, in my opinion, are not quite impossible—but they are rarely attempted!

We are not over it all as yet, and politically we shall not be in our time; but economically times are improving, which is another way of saying that Europe is recovering. "Agriculture is coming back," "good times are returning,"—which are other ways of saying the same thing. So a war in Europe affects profoundly our happiness and comfort here. We have had the proof, and apparently proof was needed, that all parts of the world are interlocked, and that veritably "we *are* brothers one with another."

Measured in years a healthy population may recover physically from war with comparative rapidity. The birth rate, which falls below the normal in war time, rises above normal just after the war, and then resumes its normal course. Soon the population is as great as ever, or greater, but with this significant difference that many new souls have been brought into existence to whom the war is only history. I read that a young boy in London, recently standing with his father near the Cenotaph to the memory of dead soldiers, on hearing an officer the the guard ordering "fix bayonets," asked his father, "What is a bayonet?" To us this is a surprising question; but if the boy were now seven or eight years old, he might not yet have heard of our Great War. A woman now aged twenty was a child of twelve when the war concluded, and of seven when it broke out. Boys in their teens below the military age in the war are just now the men about to become the most important units of society. Is it possible that all these will ever understand? I cannot tell; but it falls to us to interpret to them—if we can!

The war and all it brought were effects—not causes. I know that many relatively little things, like kings and dynasties, were added to the roll of causes of our great social cataclysm; but there could be no greater cause of our war than the growth of population and wealth in Europe, which lead to the scramble for unappropriated lands producing the raw materials for food and industry. This coupled with the operation of the great law of Diminishing Returns, caused the war, as such causes ever did. Only scholars foresee and analyse causes and consequences like these, but they, it is said, have "knowledge without power." In our war the idealism of patriotism served all the belligerents with about the same devotion. Patriotism, never stopping to examine causes, is an expression of the first instinct of the national organism to survive, as it is the first instinct of any organism *to survive*. "Patriotism," it has been said, "like other idealisms, may vary from a a noble devotion to a moral lunacy."

The war was a failure if we cannot deduce from it valuable lessons to avail ourselves of the beneficial changes it may bring about. I am unwilling to admit it was a catastrophe—though it may turn out that it has been one! Children in the past, including ourselves, have ever been beset by preventable disease and ills, by racial antagonisms, class envies, and political and religious prejudices. We may look back on ignorance in high places, niggardliness in great things, and expenditures for trivialities. But your school pupils besides inheriting this same legacy, face in the future almost over-burdening debt and extreme taxation.

And why, it has been asked, could not all these things now going on to heal the damages of the war not have been undertaken sooner? The Dawes plan could have been devised a year or two after the war instead of seven! Why have we taken so long, through a series of conferences lasting years, to whittle down the German indemnities from a figure impossible of payment, when good economists warned as far back as the Peace Conference that they could not possibly be fully paid? Why is not some scheme for the settlement of the international war debt yet arranged? Why does not the United States forgive war debts altogether? Why did it take eight years after the war to bring about Locarno? Why in 1926, cannot Germany yet be admitted to the League of Nations? Why is the League in some danger of breaking up into intriguing groups based on "balance of power?" Why not get on speedily with the beneficient peaceful business of the world and let us live more freely? "Canst thou minister to a mind diseased?" In times of emotional upset, such as during and just after war, the primitive mental processes of suspicion, hatred, fear, re-assert their strength, and only the few know them for what they really are. Public opinion takes unconscionable time to assimilate an idea. Public opinion rarely does rapidly discern what is good or bad for it. "The majority is always wrong," a cynic writes. Only the few avoid "cutting off their nose to spite their face." As we read history, as we study more closely the ideas of any great period of the past, we realize that only certain small sections of the social structure were active to think, produce and improve the ways of life. Only a small and carefully prepared few of the whole population take active part in providing the benefits which the whole race enjoy. May not the proportion of their numbers be made to grow? Does not a New Humanism seem to be required? How may it be brought about?

Here is the call to modern education—for it is the safe and dependable, though slow, method of education of the young that offers the only means or hope of freedom or survival. Class restraints, prohibitions, class domination, which leads inevitably to the degeneration of the dominating class and to revolt, will fail, as they always have failed. It is because of the efficacy of the scientific method, through the medium of education, that scientific men dare hope that the law of the jungle may in time be replaced by the law of reason—in our individual, national and international affairs.

I know that man is not entirely a reasonable creature. He possesses the qualities to reason, but he does not live by it or always enjoy using it! It would not be good science to expect as much as that! But the course of civilization should be for the law of reason gradually to supersede the law of the jungle and thereby give greater happiness and greater security to our lives. The possibility of applying physical, biological and psychological science for the welfare and improvement of the human family had already been foreseen, but by only a few. Is it not possible in a modern humanism for their ideas to spread? The material application which makes for wealth, comforts and conveniences are only a part of the gifts of science, and whether they be applied for or against civilization is for man to decide. An automobile may be used on an errand of mercy, or it may be used to assist a murderer or bandit. Hardened steel may be used for a vital operation of surgery, or it may be used in a 16-inch gun. Says one writer, "We have mainly used the immense spiritual enterprise of science only to secure five cent car fares, high profits, and joy rides, when it might have ushered in a New Humanism."

It is because of belief in the efficacy of the scientific spirit and its method that I am appealing for more attention to it in the New Humanism of which our civilization stands in need. This method is not foreign to man's nature. When reduced to its simplest expression it is no more than those processes which every intelligent person already enploys, in more or less degree, when by observations, trial, and comparison, with an eye to the future he arrives at any reasoned conclusion. But the cultivation and patient training for this method are hard and its discipline severe. That is why so many shirk its training and choose not to read its patient ways. The scientific spirit inculcates a habit of independent thought, of caution in assertion, and of critical enquiry. Its method seeks to find the rational out of the seemingly irrational, and subjects to close scrutiny both personal and mob passion and propaganda. It is systematic and methodical; it is what we call "business-like" but I think is more business-like than "Business." It looks on all sides of a question equally and not on one side only, ignoring or seeking to obscure the others. Unlike the credulous or superstitious mind it seeks to "prove all things;" unlike the artistic temperament it is not swayed immoderately by desire or emotion. It examines the unpleasant with the pleasant, the dirty with the clean. Since its dominating motion is to discover truth, the scientific spirit admits its own errors and acknowledge the weakness or strength of its own hypotheses. Honesty is its living atmosphere, and without freedom it cannot live.

Ex-Secretary Charles Hughes, in his welcoming address to the American Association for the Advancement of Science at Christmas, 1924, exclaimed, "If to an increasing degree we have the security of sound public opinion, if the extravagance and diatribes of political appeals fail of their object, and if notwithstanding the apparent confusion and welter of our life, we are able to find a steadiness of purpose and a quiet dominating intelligence, it is largely because of the multitude of our people who have been trained to a considerable extent in scientific method, who look for facts, who have cultivated the habit of inquiry, and in a thousand callings face the test of definite investigation. *With scientific applications on every hand the American people are daily winning their escape from the danger of being fooled.* There are, it is true, many false prophets who are active in those areas of exertion where patient inquiry and regard for facts are not much prized; but their following, while strident, is apparently not increasing.

We need your method in government; we need it in law making and in law administering. We need your interest in knowledge for its own sake; . . . . . your ceaseless search for the truth; your distrust of phrases and catch-words; your rejection of every plausible counterfeit; your willingness to discard every unproved theory, however honoured by tradition; . . . . . and above all your faith in humanity, and your zeal to promote the social good."

Investigations will show that the people of those communities who have heeded most the teaching of science, who have been instructed as to the causes and prevention of disabilities and disease, are happier, more prosperous and better disposed than others to help their fellowman. More than half of the earth's population, viz.: Turkey, Arabia, India, China, and Mongolia, either from lack of the specific racial aptitude for science, or something else, have shown no great interest in or talent for scientific method or speculation. From these races there are not half a dozen individuals whose efforts have greatly forwarded either ethical or material civilization in the past few centuries. Their territories are over-crowded, their standards of living and expectation of life are low; children are born to them in multitudes and only few survive, their populations are about fixed. They have been, and still are, governed, interfered with, exploited, and controlled by their more scientific neighbors. Their religions alone have been unable to stimulate to keep civilization's pace. Is it because their territories are over-crowded and the stress of life is hard that they lack the cultivation of science, or is the lack of science the cause of congestion of existence, low living, and of danger? I think the latter is correct.

It is said that all civilizations in the past had a way of secreting their own poisons, which in time sapped their vitality and brought them down. It is not impossible that will be the fate of ours! But if we could be taught to abhor the jungle law, and follow with intelligence the new Commandments of the Revelations of science there need be no downfall.

Of course old, evil and anti-progressive forces yet survive. Much administration and control falls into the hands of a superficial type of mind—the type which perceives phenomena but not the underlying causes and realities. It is this same type which treats symptoms and not diseases in medicine, which indulges in emotional revivals rather than a reasonable conviction in religion, and prefers a rhetorical flourish or a clever trickery in politics. The old spirit of persecution is not dead; the spirit may be acting in all sincerity, which is zealous to make us all conform to its own views, and seeks to visit people with persecutions when they resist or show preference for others.

I read of a zealous man the other day who would persecute people,—of course in the name of Christ—for holding intelligent, modern views on the subject of life and change. "Take the evolutionists, infidels, and no-hell teachers out somewhere," he says, "and crucify them head downwards, and we will have a better country to live in; and instead of these evolution and easy-way ideas, teach people the Word of God to go by, and all will be well." The word of God, happily, offers the choice of other means of salvation! But reading this my mind sprang at once to a famous scene—when the mob at the foot of the stairway yelled "Crucify Him, Crucify Him,"—for He had new and strange and uncommon ideas!

I heard a preacher once say a fine thing: "If the world could have been saved by good advice it would have been saved centuries ago." Changes to rectify injustices, short-sight, and inconsistencies in life will be slow. There is no short cut by a panacea; only the

dependable method of seeking information and supplying education is of any avail. Only education and trained intelligence can fit us with the means to circumvent the poisonous influences which still beset us, and to endow us with the new knowledge to control the natural forces operating within and outside of us. To be sure some of the prescribed remedies of science might be drastic—but intelligence can be brought slowly to accept them.

" . . . . . States are not made," a poet says, "nor patched; they grow."

"Grow slow through centuries of pain—
And grow correctly in the main—
But only grow by certain laws,
Of certain bits in certain jaws.
You want to doctor that. Let be,
You cannot patch a growing tree!
The social states of human kinds
Are made by multitudes of minds,
And after multitudes of years,
A little human growth appears
Worth having, even to the soul
Who sees most plain it's not the whole.
This state is dull and evil, both,
I keep it in the path of growth—
You think the church an outworn fetter;
Kane, keep it, till you've built a better—
And keep the existing social state;
I quite agree it's out of date.
One does too much, another shirks,
Unjust, I grant; but still—*it works.*
To get the whole world out of bed,
And washed, and dressed, and warmed, and fed,
To work, and back to bed again,
Believe me, Saul, costs worlds of pain.

—JOHN MASEFIELD.

The dependence of civilization upon the work of Education is becoming greater. In the past the agencies and repositories of civilizing humanism, for the promotion of human enlightenment and refinement, have been the Church, the Home, the School,—latterly there is the Press. But the first two are failing powers; their influences diminish day by day. Evidences of this lie at every hand. The mechanical and mechanistic character of our civilization must be expected, for some generations yet, to become more intense. As great towns, which are the product of industrialism, continue to multiply and grow, organized traditional and conventional religious beliefs will tend to lose vitality. Examining this tendency, one of the chief reasons is that the welfare of industrial wage-earners seemingly becomes more dependent upon human agency and direction, and less upon natural causes, than is the case with people whose manner of life is more primitive and less complex. Thus fishing and farming people, whose livelihood depends on change and caprice in the elements, are more apt to be superstitious and religiously minded than folk of the city. Again in an industrial community vast members of the population are making artificial rather than raising direct natural commodities; that is making tools, machines, and appliances by means of which others can make or raise the natural products This tends to make people become utilitarian rather than esthetic or emotional, since their products have not in themselves any direct human value. Thus the man who makes or directs a railway becomes more important than the man who ministers to others by travelling on it, though only for the latter purpose does the railway exist. The man who reads a book may never claim attention, yet for him exist the people who make the paper, arrange the type, and the advertising and selling. There is a constant tendency in a commercial industrialism to fix attention on subsidiary objects and lose sight of the essential purposes and things. And while the view of religion still persists which makes coventional religion depend too much on dogma and on fixed belief, conventional religion will tend to lose its power. Truth is not fixed but ever changing, and religion to remain vital must be able to assimilate new interpretations of truth, receiving new inspirations, and keep in touch with human needs. I make a clear distinction between conventional denominationalism and an individual's faith and feeling. When unessential accretions of conventional practice, helpful to some but unnecessary to others; and when irrational, confusing, and unessential subtleties are stripped from the body of current belief—it will easily be discerned that the simple ethical principles of the great religious founders answer more nearly universal human aspirations than anything else conventional religion has to offer. These are simple and in the light of modern knowledge easy of exposition—and until they are raised to a place of higher importance in religion, conventional belief will be is danger of gradually losing the regard of men.

In a mechanical age of easy transportation and communication, of the printing press, the cinematograph and radio, the Home must lose the preponderating influence it once possessed. It becomes so easy now to leave home; and territories are widened and possibilities enlarged for the young, or venturesome or needy to seek employment or adventure outside the community of birth. A family no longer remains together in the same locality as it used to do, but soon breaks up and scatters in many directions. When the women and the older girls go out to industrial work their care and influence over the younger members of the family no longer can remain the same; and, in addition, their own outlook and training for the future undergoes complete modification in the new and vital circumstance *that economically they become independent of men.* In turn this accelerates the process of lessening their activity and influence in the home. As a consequence the influences which surround school-age children now come mostly from the outside. The school is the greatest of these and to a great extent takes over the role of parents. When the child reaches maturity the place of the school in large measure is taken by the press. The rise of this last power is a phenomenon of our age.

School and Press then are supplanting Church and Home; outside of the factor of birth, they probably are the greatest acting social and educational influences of our day. Either of them could civilize or uncivilize. (At times, one may be excused if one's faith in one or the other of them is put to rather severe trial!) Certainly the Press as a whole has not yet come to comprehend the tremendous responsibilities which should attach to its great power. On the whole the Press is steadily and visibly improving (despite many notorious examples to the contrary). Considering the responsibility involved its owners and administrators have hardly yet acquired quite the same ethical sense of responsibility as underlie the other professions. I should say that the greatest thing Journalism could now do would be to transform itself into *a learned profession.*

Many earnest people are pessimistic about the future of society, when faced with so much evidence of this decay in influence of old cherished institutions like the Church and Home. Their pessimism seems to me to be unnecessary. We shall always have a church, man being a religious animal; a creature to conjure up visions, dream dreams, and create his gods! If a religion falls it is usually superseded by a better one; though in the process of the decay of the old and rise of the new, the material power of the race of the old religion may pass to other hands. While the Home has been a sacred

power in the past, a critical and fair examination will not entirely exonerate it of some baneful influences. The sense of family often has frustrated the ends of justice, promoted false pride, given rise to nepotism, and substituted very frequently the incompetent for the efficient. It is not at all impossible that in the future Humanism a social power cannot arise which will be as refining and sanctifying an influence as the home once had been.

But no matter how we may argue, the rise to power of the school cannot be gainsaid; and, regarded in the light of its preponderating influence over the young, *teaching becomes the most important business of the the world.* At present it is not so regarded, but any new Humanism would have to raise its status. In so far as the New Humanism will be guided by the scientific method, so far will teaching be guided by the basic urge of science—the ascertainment of Truth. The object of teaching, therefore, must be to cultivate and not deny the attitude and findings of the scientific mind.

And what is Education? I like the answer of Sir James Barrie—Education is—"that increased understanding."—An increased understanding of nature, of one another, of earth's physical and spiritual history, and of the new knowledge at hand. And what is the place of teaching? Teachers in the New Humanism will be the torch-bearers—who light the way. "Be yours to hold it high." With the tools of accurate knowledge we have to train intelligence and character; conscience and wisdom will always be the unfailing co-development.

An ideal for teaching must be to send from the schoolroom into the world a constant flow of the world's *elite.* Who are "the elite?" "They who have *the simplicity to wonder, the ability to question, the power to generalise, the capacity to apply.* That company of thinkers, workers, expounders, and practitioners upon whom the world is absolutely dependent for the preservation and advancement of knowledge, wisdom, and happiness."—(Arthur Little).

The true purpose and the aim of teaching is not merely to prepare the young to make a living, but to give a zest for life in the search for truth. If you will attend to this you need not worry about their ability to make a living—this will follow of itself. Teaching must set in the minds of the young the germ which later unfolds into a love of truth; and you will find this process involves the development of the whole instead of only a part of the pupil's powers. By means of the curriculum—or if that be impossible, in spite of the curriculum!—teaching must *indulge their simplicity to wonder, draw out their ability to question, develop their capacity to apply.* And we should not concern ourselves too much with the opinions of the "busy practical man," or the demands of the hurried business man; their opinions on education almost invariably are purely utilitarian; they are busy repeating the mistakes of their fore-fathers and often are in a hurry about it.

Creative work is natural to the young and leads to co-operative efforts. I should like to quote from the report of the Prime Minister's Committee (of Great Britain) on Education, under the chairmanship of Sir J. J. Thomson, 1918:

"It is the function of any system of education to *discover ability* as well as *to develop it,* and under a system in which the curriculum is bookish" (they might have added "and over-full") "many able boys may be depressed and lose all interest in their work *from want of success and opportunity to reveal their talents.* . . . . Too few parents of this generation can satisfy their children's curiosity about the wonders of heavens, the growth of plants, the history of the rocks, the dawn of animal life, the causes of tide and tempest. How necessary science is in war, in defence and offence, we have learned. How it contrubutes to the prosperity of industries and trade all will admit. But few have accepted in full faith how valuable it may be in opening the mind, in training the judgment, in stirring the imagination, and in cultivating a spirit of reverence. A nation throughly trained in scientific method, and stirred with an enthusiasm for penetrating and understanding the secrets of nature, would no doubt reap a rich material harvest of comfort and prosperity; but its truest reward would be that it would be fitted by an ample and generous education to perform justly, skilfully, and magnanimously the offices both private and public of peace and war."

From the schools, therefore, must flow a steady stream of young people whose developed curiosity, powers of observation, sense of fairness, with a little knowledge, will be the guarantee of the security of the future. To that end the most important element of the schools, their vivifying inspiration, should be found not in the curriculum, but *in the character and personality of the teachers themselves.*

Now this is very different from a system of education operating almost entirely in retailing information to young people from an overcrowded curriculum. This informational and quantitative education is being found defective; its operation has proved wanting. Inevitably its fate is to break down, if only from the mere considerations of inability to keep pace with advancing knowledge, and of limitations in the supply of public money. The curse of an informational and quantitative instead of a developmental and qualitative system of education, has come to us from the what has been called "greatest half-educated country" of the world—the United States—from the United States via mostly the Province of Ontario.

Have we perceived the strength of the reaction against it in the United States? Not yet, but we shall. The origin of the informational system was in the too ready response to the demands of employers for workmen, technicians, office help and flunkies capable of making immediate practical use of a little information, a little training in the exploitation of new resources, and in the acquisition of new wealth by a new population let loose at the natural wealth of a whole continent. This demand has unduly and wrongfully influenced educational policy and practices throughout the whole educational system from the universities down even to the primary schools. The stuffed curriculum was a natural consequence and also the practice of regaling a youngster with snippets of almost everything. At best in such a system only a part instead of the whole of a boy or girl's powers get started at development. Further it is an ignoble and perverted view of democracy which constructs educational policy on the falsity that all boys and girls are born equal; and it is a poor practice of democracy to exhaust the resources of the tax-payer in educational provision for the great, average majority and not provide specially for the exceptionally gifted few. If "the masses do tomorrow what the thinkers think today," a truth confirmed by all history, surely it should be the place of educational policy to provide specially for prospective thinkers—for those who show "the simplicity to wonder, the ability to question, the power to generalize, the capacity to apply." In North America such principles have been unseen and therefore ignored. The reaction is at hand. We discern the signs of change in the prominent universities of the United States; but except in the cases of some prominent private and high schools, the movement has not yet reached down to the masses of the schools.

Teaching is arduous and full of disappointments; but association with the young is a great privilege, "a vaccine against apathy and age." Only the student can be a real teacher and only the student can inspire. Earnest students are searchers after truth, even though it may be hard to find. On the truths which science has revealed, and is revealing, I pray we enter the New Humanism with the scientific spirit, feeling no anxieties, doubt or fear. "Fear is the son of Doubt and Ignorance, Intolerance is its child!" Truth is the base of all true virtue, and only the truth can make men free. And this is why I take such pride in our profession—in that in everything we may do or in all we may say, we may inspire the young to seek the truth—for the accomplishment of human freedom.

Here is the spirit for a New Humanism:

"Take from the past the best its toilers won,
But learn betimes its slavish ruts to shun,
Pass the old tree whose withered leaves are shed,
Quit the old paths that Error loved to tread.
And a new wreath of living blossoms seek,
A narrower pathway up a loftier peak.
Lose not your reverence, but unmanly Fear,
Leave far behind you—All who enter Here."

# The Book of the Machines

**OR A MODE OF DECLINE OF OUR MECHANICAL CIVILIZATION**

By Dr. R. W. Boyle

My title is a parenthesis from Samuel Butler, who, about the year 1870, wrote a book of fine imagination and genius. Butler made a man of our civilization discover the land of Erewhom, where ideas, laws, and customs were almost the opposite of our own. The visitor stood trial before a magistrate when the Erewhomians found that he was suffering from a cold, and it went hard with him that a watch was found in his waistcoat pocket. In Erewhom it was a crime to be ill, another crime to be poor. Bad luck, loss of fortune, or of a friend, were offences against society and very severely punishable.

But the Erewhomians the visitor discovered to be a great and magnificent people. Their men were powerful, dignified, and self-possessed. All the women were beautiful. Even in old age both men and women retained their handsome looks. The children were numerous and merry, and all of them enjoyed the prevailing health and beauty.

There were no mechanical implements or machines in Erewhom, though the visitor, when he had made friends, was shown traces of old ruins which, so his new friends informed him, used to be, some hundreds of years back, what we should call a railway station. And in their museums he viewed old remnants of broken apparatus and machines, ticketed and annotated and carefully preserved in especially designed cases.

After he had learned the language the visitor resorted to their famous city, the City of the Colleges of Unreason. Here professors and students studied a hypothetical language, in fact regarded Hypothetics as a most important subject. Nevertheless, on meeting many of the graduates the visitor was struck by the fact that, in spite of their great attention to this apparently useless subject, these men and women showed the most practical sense and sagacity in the common affairs of every day life. Their minds seem to have been extraordinarily well disciplined and well developed.

In this city the visitor had the good fortune to meet a famous scholar, celebrated for his knowledge in the antiquarian study of Mechanical Lore. And, greater fortune still, the visitor obtained from this celebrity a copy of the famous Book of the Machines, which hundreds of years previous had brought about in Erewhom the great revolution of the destruction of the machines.

By paraphrasing a few brief abstracts I shall give you an idea of the contents of this famous *Book of the Machines.*

Its author, in his time a famous professor of Hypothetics, opens thus:

"There was a time when the earth was to all appearances utterly destitute both of animal and vegetable life, when it was simply a hot, round ball with a crust gradually cooling. Now, if a human being had then been allowed to view it, as though it were some other world with which he had no concern, would he not have pronounced it impossible that creatures possessed of anything like consciousness should be evolved from the seeming cinder which he was beholding? Would he not have denied that it contained any potentiality of consciousness? Yet in course of time animal, and man, and consciousness came. . . . ."

Therefore it would be rash to say that no other phases of life and consciousness than ours can be developed, and that animal life is the end of all things. The writer inquired whether traces of such a new phase of life could now be perceived on the earth; whether in fact the primordial germ of such a kind of life could be detected. He answered this question in the affirmative, and in reply pointed to the higher machines.

There was no security, he considered, against the ultimate development of *mechanical consciousness,* because machines possessed no, or little, consciousness at present. Note how slowly the animal and vegetable kingdoms are advancing, then reflect upon the extraordinary advance which the machines had made during only the last 100 years. Assume that conscious beings have existed on earth, say for some 20 million years, see what strides machines have made in the last 1000! May not the world last 20 million years longer? If so, what will the machines not in the end become? He feared none of the existing machines. What he feared was the extraordinary rapidity with which they were becoming something very superior to what they were at present. No class of beings had in any time past made so rapid a movement forward. Should not that movement be jealously watched, and perhaps checked while man could still check it?

"Where," asks the Professor, "does consciousness begin, and where end? Who can draw the line? Is not machinery now inseparably linked with animal life in an infinite number of ways? And who can say that a machine like a vapour engine has not already a kind of consciousness? It must be fed with food (fuel) which it consumes by oxidation even as man consumes his; it supports its combustion by air as man supports his; it has a pulse and circulation as man has. It may be granted that man's body is as yet the more versatile of the two, but then man's body is an older thing. Give the vapour-engine but half the time that man has had, give it also a continuance of our present infatuation, and what may it not ere long become! . . . . Think of what this machine can already do! One travelling machine calls to another in a shrill accent of alarm, and the one called to instantly retires. It is true that it is through the ears of the driver that the voice of the one had acted upon the other. But there was a time when it must have seemed highly improbable that machines should learn to make their wants known by sound, even through the ears of a man; may we not conceive then that a day will come when those ears of man will be no

longer needed, and the hearing will be done by the delicacy of the machine's own mechanism? When its language shall have become developed from a cry of alarm to a speech as complete and articulate as our own! . . . .

Even now the machines will only serve on condition of being served, and that too upon their own terms. The moment their terms are not complied with, they jib and either smash themselves and all whom they can reach, or turn churlish and refuse to work at all.

And take man's vaunted power of calculation! Have we not engines or machines which can do all manner of sums more quickly and correctly than he can? In fact when precision is required man flies to the machine at once, as preferable to himself. Our sum engines (adding and multiplying machines) never drop a figure; the machine is brisk and active, when the man is weary; it is clear-headed and collected when the man is dull; it needs no slumber when the man must sleep or drop.

Man has descended from beings which had no consciousness at all. There is then no *a priori* improbability in the descent of conscious machines from those that now exist; except, possibly, that which may be suggested by the absence of the machine's reproductive power. But is not this absence more apparent than real? Surely if a machine is able to reproduce another machine systematically we may say it has a reproductive system. And how few of the machines are there which have not been produced systematically by other machines. Now in the plant and animal kingdoms whole species of plants or animals would die if their fertilization was not effected by a class of agents utterly foreign to themselves. Insects may make many of the plants reproductive; and in the human family, each one of us has sprung from minute animalcules whose entity was entirely distinct from our own; which acted after their own kind with no thought or heed of what we might think of it. Then in playing his role in the production of machines, why should not man be acting merely as part of the reproductive system of the machines like these little creatures are acting as part of our own? Though machines cannot be said to have more than the germs of a true reproductive system at present, have we not just seen that recently they have obtained the germs of a mouth and stomach? And may not some stride be made in the direction of true reproduction, which shall be as great as that which has been taken in the direction of true feeding?

But it may be advanced, even though machines should hear and speak, they will still always work for man's advantage, not for their own; man will always be the master and the machine the servant. "This is all very well," says the Professor, "but the servant glides by imperceptible approaches to the position of the master; and we have come to such a pass that, even now, man must suffer terribly on ceasing to benefit the machines. If all machines were to be annihilated at one moment, so that not a knife, not a lever, nor anything whatsoever were left to man but his own naked body, and if all knowledge of mechanical laws were taken from him, so that he could make no more machines, we should become extinct in six weeks. *Man has become already so dependent on the machines, that his very soul is a machine made thing. He thinks as he thinks, and feels as he feels, through the work that the machines have wrought upon him.*

. . . . . Further, the machines have preyed upon man's grovelling preference for his material over his spiritual interests, and have betrayed him into supplying for them that element of struggle and warfare without which no race can advance. The lower animals progress because they struggle with one another; the weaker die, the stronger breed and transmit their strength. The machines, being of themselves unable to war and struggle, have induced man to do their struggling for them. As long as he fulfills this function duly all goes well, at least he thinks so; but the moment he fails to do his best for the advancement of machinery he is left behind in the race of competition. How many men and women at this hour are living in a state of bondage to the machines? How many spend their whole lives from the cradle to the grave in tending them by night and day? Is it not plain that the machines are gaining ground on us, when we reflect on the increasing number of those who are bound down to them as slaves, and of those who devote their whole soul to the advancement of the mechanical kingdom? . . . . .

And the misery of it is that man has been blind so long already. In his reliance upon the use of steam, and its machines, he has been betrayed into increasing and multiplying. To withdraw mechanical power suddenly would have the effect not only of reducing us to the state in which we were before its introduction; but there would be a general break-up and time of anarchy such has never been known. *It would be as though our population were suddenly doubled, with no additional means of feeding the increased numbers.* It is the machines which act upon man and make him man, as much as man has acted upon and made the machines.

We must choose, declares the Professor, between the alternative of undergoing much present suffering, or seeing ourselves gradually superseded by our own creatures, till we rank no higher in comparison with them than the beasts of the field now do with ourselves.

That, in very brief abstract, was the Book of the Machines.

The ideas of the professor made a great stir in the population. Of course there was controversy, a really serious attempt at refutation being by another professor. The latter held that machines were to be regarded as a part of man's own physical nature, being really extension or *extra-corporeal limbs.* The lower animals kept all their limbs close at hand, so to speak, attached to their own bodies; but many of man's (a higher animal) are loose and lie about detached, some being occasionally hundreds of miles away. He held we use our own corporeal limbs only as machines; a natural leg, for example, being only a much better artificial leg than anyone can manufacture. Even community of limbs is hereby possible, for a train is only a seven-leagued foot that hundreds of people may own and use at the same time.

"How greatly," he wrote, "do we now live with our external limbs? Man has now many extra-corporeal members which are more important to him than a good deal of his corporeal organs such as his hair, his toes, or his appendix. He becomes more and more complex as he grows older; his memory goes into a note-book, and we may see him already with sight engines (or spectacles), artificial teeth, and artificial hair. If he is a really well-developed specimen of the race, he will be furnished with a large box upon wheels, two horses (or a motor) to drag it, and a man to sit upon it." "Who shall deny," he says, "that one who can tack on a special train to his identity, and go wheresoever he will and whensoever he pleases, is more highly organized and valuable than he whose legs are his only means of locomotion. That old philosophic enemy, matter, still hangs about the heels of the poor; but to the rich matter is immaterial, the elaborate organization of his extra-corporeal system has freed his soul." No, the one serious danger which this professor apprehended was that the machines would so equalize men's powers, tending to make the weak equal to the strong, and so

lessen the severity of competition; that many persons of inferior physique would escape detection. These would transmit their inferiority, and the race in consequence become permanently deteriorated.

I have taken so much time for the book of the machines and the argument against it because of their paradoxical and amusing cleverness.

The controversy raged and intensified, then it advanced from controversy to acute dissention and from dissention to revolution. A counter-revolution had nearly proved successful. Civil war had raged for many years and reduced the population by one-half. The anti-machinists were finally victorious and treated their opponents with great severity. But after the armistice and several more years of conferences and diplomacy it was finally settled that all inventions discovered in the preceeding 271 years were to be destroyed. This period was agreed on after much trouble and dispute. It appeared there was a difficult question as to whether a certain kind of mangle, which was greatly used by washerwomen, should or should not be destroyed. After acute controversy the mangle was at last ruled to be dangerous, and was just excluded by fixing the retroactive period at 271 years. The new laws declared that improvements and inventions of any kind were strictly forbidden; and an infraction of these laws were to be considered as heinous an offence against society as the contraction of typhus fever, which was one of the worst of all possible crimes.

"When some 300 years later all the passion had cooled down, and no one but a lunatic would have dreamed of re-introducing forbidden inventions, machines came to be regarded as a curious antiquarian study. Then came the careful search for whatever fragments could be found to display as historical relics in the Erewhomian museum. And numerous treatises were written showing what the functions of each re-discovered machine had been." All this was undertaken with the same enthusiasm and interest as our scholars display when they discover flint arrow heads, prehistoric pictures, or the relics of a long-forgotten religion.

Butler's clever fantasy is as great a satire as has been written on our industrial civilization; and remember it was written as far back as 1870, in the days without electric motors, automobiles, telephones or radio. He was a fresh thinker, and an artist, though eminently practical and a devotee of modern business success. He fought the Darwinian idea of human evolution, his opposition being rather blindly instinctive than rational. No doubt it was Butler's love of individual freedom which impelled him to decry anything tending to place man or man's spirit on bondage.

But in the serious opinion of most of us a stranger case can be made out that modern mechanical science has freed the human spirit, and brought a more glorious reign of liberty—though manifestly imperfect—than has ever before existed on this earth. Science ultimately is beneficient and not brutal; and it is due to sicence that our civilization has made any advance at all in the past three centuries. In literature, art, and philosophy our standards today are those which prevailed as far back as the Greeks. The mechanical scientific age is in its passage through an era of great glory, which human generations in the distant future will look back upon as an age of surpassing brilliance. Those of my audience who listened to my address yesterday will have no doubt of my opinions on the benefits of scientific advance.

But due to human mental inertia and remaining instincts of savagery the triumphs of mechanical science have been accompanied by great attendant evils. The very number and rapidity of discoveries and inventions have been so great, and the new social practices and ideas they have initiated have become so complex that political science, ethics, and religion have been unable to maintain their pace. In consequence there is now abroad a sense of many social injuries and inequities, and there exist strains on human nature from the thwarting of all natural instincts and desires. Civilized nature has not yet found its proper social adjustments to the new conditions in its new environment.

It is not my purpose tonight to make this address a series of parallels or comparisons showing how much of Butler's observations have been confirmed in our times, though that would make an engrossing subject! Rather, I wish to speculate, to propound a question and attempt to answer it. Will our kind, as did the race in Butler's fantasy, because of fear of bondage on the human spirit by subservience to machines, rise up and destroy them? In other words, will our descendants at some future time of their own will, revolt and rise and destroy that mechanical industrialism on which we so pride ourselves as the brilliant achievement of our times? This address is really a short study of industrialism.

In spite of its accomplishments an indictment against industrialism may be made very heavy. It is true that industrialism has created the city slum, substituting it for the simple peace and fresh air of the country; and has drawn people to live in over-crowded cities, where enervating noise and other wearing distractions in time undoubtedly do vitiate the mental and imaginative powers of their inhabitants. (I get plenty of evidence of this in my university classes.) Scientific discovery has found great stores of materials and latent energy in the earth, and invention has found the means to release and utilize them. The need for labour has therefore enormously increased and with it also labour's productivity. Populations have increased greatly in reponse, creating the new social conditions of life I have referred to. More and more luxuries have become possible to all, and new relaxations and sensations are being confused with and mistaken for true pleasure. Man has always been a pleasure lover, but in our day the growth and love of luxury and pleasure is more extended and widespread than ever was the case on earth before.

The urge of the present life is towards a speeding up, a more intense complexity. Often it is wrongfully regarded that the economic is the most important part of life because this is the part concerned with production and utility. We trace the decay of individuality and feel the uniformity that is coming over all. Our clothes, habits, and opinions tend all to be produced to accepted patterns, and individuality, or even originality to be eschewed.

Today it is hardly possible to meditate or contemplate as once could be done; and since great, original, literature and art require the cultivation of individual traits and feelings, and require the opportunities for meditation and reflection, great art and literature are tending to decline. In time great sicence also may feel this languishing effect.

Our public education has not yet shaken off the character which industrialism placed upon it. State and private education, in schools and universities alike, is conducted by the rules of uniformity, and is marked by materialistic outlook and superficiality. So far it is the informational and quantitative, rather than the developmental and qualitative idea of instruction which has prevailed. This is the inevitable consequence of supplying to the needs of industrialized commerce boys and girls, men and women, possessing a little of information, knowing a little of some particular process, to fill a more or less pressing though perhaps really only a temporary demand.

Greatest influence of all our industrialism has continued to intensify the great class war whose end cannot be foreseen. No amount of preaching, conferences, advice and admonition seems to affect its progress. Some observers had foreseen that industrialism, by the mode of its progression, would inevitably tend further to separate the workers from the owners. As the distinction between these classes grew, thereby would be disclosed in greater clearness what it was the workers lacked and what it was the masters had. Tension, jealously, and envy would thereby be engendered, and finally usher in the bitter modern phase of a great class and labour war. All this has happened. The number of socialists of various kinds among the proletariat continually increases. They often now can force the policies of governments, can even form some governments. The masters themselves have absorbed much socialistic theory—perhaps often not recognizing it. The tendency of legislation almost everywhere is distinctly socialistic, sometimes even paternalistic. Yet peace in this class struggle is not in sight; and in our modern world there does not seem to be much likelihood for it to come as long as capital is not also labour, and labour does not own capital. There is a corrective modern tendency this way, signs of which are found in the newer kinds of profit-sharing, and in the spreading of the practices of widespread possession of stocks.

But for my thesis tonight there is no great difference between capitalism and socialism, for industrialism includes and is greater than them both.

Capitalistic industrialism can merge, and may be merging, into the socialistic, and yet the worst evils of industrialism, some of which only I have here discussed, be very rampant. There is no great difference in kind between the control of industry, commerce and finance by groups of private capitalists and by groups of nationalised bureaucrats. Socialistic nationalisation therefore will not destroy industrialism but only somewhat tone its character.

Under any industrialism the tendency must be towards the accession of power to the hands of dominating individuals, and towards the standardization of the great bulk of men. For we can see the steady tendency always is towards larger and larger industrial organizations, controlling more and greater operations—the formation of amalgamations, syndicates, groups, trusts—for producing, for manufacturing, for marketing, sometimes for all together. This economic evolution is not necessarily an evil, on the contrary, it may be, and should be, a benefit; but sometimes if utter monoply be uncontrolled evil social and political consequences will ensue. The group so formed necessarily become more group conscious, and in time more controlled and disciplined by their leaders. The authority of relatively few able and powerful personalities will increase, so that it becomes possible for a few dominating types of men to exercise command over the activities and even the livelihood of great masses of ordinary men. The attempts to hold this in check by universal suffrage, precautionary legislation, protective association, trade and political unions, form now the greatest complications of our industrialized politics.

The same processes go on in every single industry. Today there is the remarkable phenomenon of the most conservative and least radical of men—the farmers—organizing and combining for marketing and selling, not at all because of fancy or for fashion; but as an act of preservation of themselves.

Similar processes of evolution invade all our activities. Men and women group themselves for social, legislative, educational, technical, and all other purposes. The cause and impetus have come from the advancement of machines, which now tie the world together—by the railroad, the steamship, the automobile, the aeroplane, the telegraph, the newspaper, the telephone, the radio—and have made of the whole world one exploitable neighborhood. Inevitably large groups have evolved where individuals or only small groups before existed. The individual finds himself ever more hopelessly unable to grasp the trend of events and work of his time. The social mill is so complex in our day that it is now not in the intelligence of any one to fit himself completely into it. Consequently we find our time to be an age of committees, assemblies, conferences, leagues, unions, and conventions. Example—Why are you here in Calgary today? And this process is irresistible, an inevitable consequence of industrialism; it is not necesarily evil, but good or evil *it cannot possibly be legislated or commanded back.* Moreover such evolutions do not spring even from man's desire or choice, but because of a human biological necessity, a necessity surprisingly little known. They arise from the significant, perhaps ominous fact—*that whereas mechanical industrialism has evolved quite rapidly, the brain of man has evolved but slowly.* Herein may lie a danger,—"Biologically speaking," says Schiller (in Tantalus), "man has ceased to be a progressive species long ago." . . . . . "The evolutionary impetus which carried our ancestors from the level of the ape, or even of the lemur, to modern man, seems to have spent itself, by the middle of the paleolithic period, *i.e.*, say 30,000 years ago. The cro-magnon people who then appeared upon the scene were in no wise inferior to any subsequent race of men, either in stature or in brain capacity. They averaged 6 feet 3 inches in height, with one-sixth more brain than the average European,"—and later, he says, "Clearly it is risky to expose the inelastic nature of so stubbornly conservative a creature as man to new conditions at a rapid rate. He may not be able to adapt himself quickly enough—and his old reactions, which did little, or no, harm before, may become extremely dangerous."

The possibility is seen then that the exactions of our mechanical civilization may be demanding from man more sagacity and brain power than he possesses, or may be able to give to it. It is this reflection which really prompts my speculation. Will man, out of opposition, or out of fear, or out of failure to control the menace to his freedom, forsake his industrialized existence, and, speaking metaphorically, cause the destruction of his machines. Deliberately, probably he will not, but nevertheless I think it likely that *mechnaical* industrialism is not likely to survive for one or both of two great reasons.

It may be that unconsciously man, as an animal, will prove too intractable to be dominated by mechanical complexity. For man is a conservative animal and difficult to manage. To every one of what I have touched on as industrial evils there is discernible the traces of an instinctive opposition.

The characters and attributes of ourselves have been thrown into high relief by the modern biological and psychological experimental studies. It seems that we are not peaceful, and reasonable, and static creatures. Man is a restless, dynamic animal; loving to hunt, fight, venture and intrigue. He possesses in varying degrees the powers to reason, but he does not live by it or always enjoy using it. He commits unreasonable acts, and bolsters up his motives for them by rational excuses and plausibilities. He could be endowed with leisure, security, peace, and plenty, and yet remain unsatisfied. For he is moved unconsciously by inherited instincts and organic appetites, is possessed of ambitions, excitements, strange likes and dislikes, some of them from the jungle and others from the herd. Most of his

motives are unconscious, or sub-conscious; but all are imprints of our mother nature, who through the contortions of our evolution caused us to be built that way.

Says Sir Arthur Keith (Conway Memorial Lecture, 1925, Sci. Proc. p. 123, July, 1925), "Man has climbed up the ladder of civilization, but it is the same old body and the same old brain which he has dragged up with him. Every one of us is the descendant of a member of a hunting pack. Our bodies and minds were evolved in the environment of hunting and fighting during an uncountable number of generations. Our brains are equipped for such a manner of living. It was then that the inner sanctuary of our mental lives ran riot with the hobgoblins of superstitions."

"There has been progress; a truly rapid and marvellous progress it has been; but we have brought with us the old brains and the old heart from primitive times. Every child is still born a savage; his task in life is to climb the ladder of civilization."

It is likely that in the end the character of the pressure of our growing industrialism would outrage the instinctive desires and appetites of such a creature, and bring about revolt.

But whether or not, a second reflection, in answer to my speculation, is that a dominating mechanical industrialism will not survive but will almost certainly expire of itself by reason of its own inherent impossibilities. Mechanical industrialism will outrun itself, and dwindle, may be not to complete extinction, but to an indispensable and valuable minimum. Though at present intensifying prodigiously, mechanical industrialism will constitute but a passing phase, "a brilliant and short-lived flare," in the total history of man's habitation of this globe.

Some socialists opine that industrialism must lead to a final, complete and universal socialism—with one world government, no war, and everlasting peace; otherwise, so they maintain, civilization itself cannot survive. But this, I think, is what the decay of industrialism may not permit. After a period of internationalism, or pseudo-internationalism, and peace, there may recur a kind of nationalism or regionalism—though in greater units of people and territory than before—and a revival of wars, all for the cause of pressing needs of great populations for raw materials and for food.

The reasoning is not intricate. This prosaic but crucial fact seems to have missed the consideration of most social students—that mechanical industrialism *has become and is possible solely through the existence and possession of metallic materials.* Even if sources of power, like coal and oil and water, exist in exhaustible quantities—which they do not—they would be unable to maintain an industrial civilization without the metals.

Now metals are tending to become an insufficient necessity, as a result of the incessant demands for mechanical appliances. The call for metals impells the search by prospectors for deposits of rich metallic ores. A rich Bonanza mine is discovered, soon worked out, and then forsaken. When Bonanza mines can no longer be exploited, the demand seizes on larger and lower grade deposits, where with scientific ingenuity the yield of metal is obtained. Increasing demand and increasing consumption results in speeding up the exhaustion of all mines. Today their life is shortened to decades instead of centuries as in the ages gone by. "From a mine there is but one crop; forests may grow again, but mines never," says a United States writer. Another has likened the progress of mining to a forest fire, "which proceeds on an advancing front, blazing furiously as it goes, using up all materials and leaving a dead world behind." Similarly will be the tale with coal mines, and similarly, but passing very rapidly, with oil and gas wells. It is true, of course, that as we extract metals from the mines there accumulates at hand a constantly growing stock of metal; the proportion actually lost forever is constantly being diminished. War is about the greatest ravager we have, but we are not constantly at war. But, nevertheless, the increasing use of metals forges ahead of the supplies existing in the earth, and these are being depleted with ever growing speed.

The great basic metals like iron, copper, zinc, aluminum and tin will become semi-precious; though they may never be absolutely exhausted; future generations will see to that. And, although we cannot assume that all the great deposits of metals are yet known, and must make allowance for new discoveries, yet with the increased and growing use we cannot now be sure that we shall have metallic materials for more than a century or so, *at prices anything comparable with those of today.* I mention price as an essential factor involved, for price is an index of the accompanying requirements of human labour—as the labour element increases the cost of any process augments according to it.

What I have said about the metals will apply in time to oil and coal, but these of themselves could not keep a mechanical civilization going. The modern locomotive machines have made oil, as well for lubrication as for propellant, one of the most spectacular minerals of the world. The near exhaustion of the known supplies is not so many decades off; and oil companies and governments are now ransacking the earth for new prospective sources. When the large pools will be gone, there will follow the laborious effort to extract our needs from oil shales and sands; in which case the labour element must mount and price increase to correspond.

Coal we shall have when the oil is gone; but the supplies are not unlimited. The easily mined coal will be devoured first; then comes the working of the deeper and the less valuable seams, with the greater use of labour and the constant increase of cost. At the same time greatly increased quantities of coal will be needed to extract our needs of metals, not, as at present, from relatively rich ore, but from the ordinary country earth and rock.

In the declining days of industrialism natural gas snd petroleum can be left out of account as significant aources of power. Water-power will never be sufficient, so that we are left with coal as the great main source of heat and power, unless revolutionary discoveries find something else available. The tides, winds, waves, and direct sun-power, may eventually be used. There is nothing revolutionary or impossible about such eventualities; we could use them now if we were so obliged. But they can be used only on terms of greater cost and labour, and even then in limited measure if the metals will be insufficient and still required to make machines. As far then as can be foreseen the existence and possession of metals will still remain the foundation stone of any mechanical industrialism.

Considerations of this kind are often summarily dismissed by a comforting state of mind and dictum which imputes to science the power to find, in never ending sequence, all that we may ever need or even desire—new foods, new materials, and new energies, as our present stores will peter out. Science may,—I hope it will. Without doubt science can and will do wonders. But the point has been missed that even science cannot effect its applications without materials; and the inventions of science to produce machines have always required above all else copious supplies of metallic elements. We have no indications of others to take their place. One may argue that science may find substitutes for the metals. It may, but there are no signs as yet! And then it is just as good an argument

that science may not! We cannot assume that even science will be able "to make a silk purse out of a sow's ear." Nor should it be expected!

The effort will be made, and it has already been begun, to spare the metals and use where possible the more plentiful materials of the earth's crust. This will be done where economic considerations compel. Thus from a press despatch, October 27th, 1925, Gloucester, England: "The world is now entering the concrete age that will last forever, after having seen the stone age, the iron age, and the steam age," . . . . . "Already people are walking on concrete pavements, riding on concrete roads, travelling over concrete sleepers, living in concrete houses, and working in concrete offices. They are housing cattle in concrete farm buildings; storing grain in concrete silos, and using concrete for scores of other purposes. And finally, when they end it all, they are sleeping peacefully beneath their concrete tombstones."

All this is so and it is wise, for it spares the metals. Concrete is simply pulverized rock mixed with a little binding material. But you can never have a concrete boiler of our locomotives, a concrete engine of our motor cars, or concrete armature of our electric dynamos.

It will not satisfy blindly to believe that we shall forever be able to find at hand materials suited to our industrial needs. This would not be good science. A surer and safer course is to consult the science of mathematical progressions, practise the caution of conservation, and give heed to the great economic law of diminishing returns. These will lead us to the safe conclusion that the use of metals and consequent intensification of mechanical industrialism will rise to its climax,—and the gradual fall-off in a long drawn-out decay.

The climax we have not seen yet, nor will it occur in our time, but it will arrive within a century or two. In time the use of mechanical power, now drawn mainly from accumulated stores of coal, will follow this same course. Revoluntionary discoveries may be made, but they will only postpone such changes and not prevent them. Similarly increased scientific efficiency in machinery, management, and labour only can postpone. Substitutes in some cases will be found, but this will be accomplished only at the cost of greater labour, *i.e.*, of higher price relative to the cost of labour and of a far greater number of mouths to feed. It is of course just as good a speculation that revolutionary discoveries will not be made, especially if there are not the materials at hand for science to employ, or if the necessary materials are too rare or too high priced.

After the industrial climax an increasing portion of human life will be given to laborious processes for a greatly increased population; and *tanto quanto* an increased amount of labour to raising food from a soil by that time crowded.

Ultimately it is the soil which will limit the earth's population; this one of the contentions of Malthus has not been and cannot be refuted. With the present rate of population increase, and the present average span of human life, the earth's population would double in less than a century. Of course it will not so double (unless there should happen to be work for them all) for nature, either by its natural or by its rational selection, will set the limit. But in the afternoon of the great mechanical age there will be crowding in the human family; and "with the low cost of human lives" (for there will be plenty of them) "and the high cost of machines, it will follow that much machine work will of necessity revert to simpler methods by hand, animal, and brain."

Already we can get the glimmering of an idea of how great can be the turn over. A report of a survey, taken since the war, of the mechanical power used in the United States, came to my hand recently. There was a grand total of something over 500 million horse-power availed of by a population of about 105 million people, *i.e.*, about five horse-power for each man, woman and child. Since a man's power mechanically is less than one-tenth of a horse-power, we may say that the above is equivalent in slave labour to more than 50 slaves for each inhabitant of the United States.

The civilization of ancient Greece and Rome rested on slave labour. Athens at one time had 400,000 slaves to 100,000 free citizens, or 4 slaves to one. Already we in our day have the equivalent in mechanical power of 50 slaves to one. Now if the supply of metals were to cease, or cease in part, so that we could no longer exact our full requirements of mechanical work from our slave machines, imagine what would be the demand in human labour should the race attempt to maintain for itself the same freedom of motion, liberty of action, and standard of living, which it will be enjoying at the high noon of the industrial era. The earth of course could not maintain, at present civilized standards, the human creatures involved.

"Any forecast therefore, based on human factors and the law of diminishing returns, will anticipate the burning out of the fires of our complex mechanical civilization, and after that again a simpler life—not in truth like that of our forefathers, but less complex and perhaps less distracting than our own."—(*Finneman.*)

Certain it is that the later stages of industrialism will be very different from ours. At present industrialism is wasteful—later it will of necessity be conservative. Land and forests, fisheries and mines will be most carefully worked in order to provide subsistence, through as many generations as they can stretch, for vast populations.

Some socialists aver that when populations realize how readily resources of raw materials may be totally consumed their nationalization will be inevitable, and national, and perhaps international, socialism certain to ensue. It may be so! But it does not follow that socialism would conserve the resources; for thus far as we observe, socialists can be as improvident as any when administering their fellow creatures' assets and resources. And national socialism will not necessarily prevent international or inter-racial, or inter-regional struggle, intrigue, and war, over sources of materials and food by which a people must be kept alive. Man, hungry, can war for food even though he be a socialist.

The diminished complexity and intensity of industrial civilization need not necessarily involve a loss of intellectual life. Many earnest souls would doubtless wish to see the change in their own time, in the hope that mental energies might be diverted into new directions, and bring revivals of great spiritual values like great art, great literature, great philosophy, and sound religion. We should like to claim this consequence as certain, but we cannot go so far. History offers us the lesson that hitherto the periods of the world's great intellectual activites have coincided with those of greatest material expansion. It was the case with ancient Greece, and with the Arabs, and with Elizabethan England!

As industrialism will decay the natural tendency in a crowded world will be for populations to live and work as near as possible to the sources of the food. Happy are the people who possess great stretches of cultivable soil. And science in the declining days of mechanical industrialism will be needed more than ever to conserve and to make more effective and more lasting such mechanical processes as populations will require and can hold in order to survive. Much scientific energy will

be turned from the field of mechanism to the social field of biology, sociology, and politics; for great pressing problems will supervene, problems for the regulation of a crowded world on a limited supply of soil—unless civilization will be content perpetually to undergo the letting of its blood and the destruction of its surplus by nature's selective agencies of wars, famines and disease.

Now the changes which I have here discussed are not the changes of millions or even thousands of years hence, associated with hypothetical events like the coming of an Ice Age, or the extinction of the sun. They are the changes of only one or two centuries hence, before the nature of man could have time to be modified, and while he remains a creature very much like what he is today. Along with his animal instincts the old refining forces will still be working in him—the love of nature, love of handiwork, love of make-believe; and gentle influences of religion, idealistic science, and literature and art. These could not die! "What man really wants" says somebody, "is not wealth or even pleasure, but opportunity for rich activity, power, and freedom, and *the satisfaction of the sense of his own importance.*"

And why speculate on these questions of the future, of problems centuries hence? It may be asked, though I persume it is improbable that people who would ask such questions would be among the ranks of teachers. Indeed it would be as well if such were not! I suppose it is obvious that one practical result of these speculations might be the demonstration of the continual necessity for national conservation and for thrift—but more—and for greater reason! We speculate because we cannot help it; for speculation is the first move in the search for truth!

It is Truth only which lies as the base of all real Freedom, and what man wants most is *to be free!* Truth is not fixed but ever changing, and I cannot see that truth in itself has any real significance. But when its simple and grand purpose is revealed, the search for Truth becomes life's dominating passion. What is Truth. It is that by which we attain the greater Freedom. "And ye shall know the Truth—for the Truth will make you free." Without complete freedom, not only freedom from political and social or military tyranny, but from deceit, from false religion, from hypocrisy, from disease—the sense and appreciation of beautiful things cannot be well satisfied; by repressions, prohibitions, and restraints, the sense of beauty is ever warped and marred. So Truth, Beauty and Freedom will be forever inseparable.

Since man will be free he will ever speculate, through all changes, in his instinctive search for this Inseparable Trio. Industrialism is the working of man's intelligence in our age, and with its achievements and triumphs is part of his great search, despite its many ills and trials and defeats. By a study of it we can, as well as by anything else, bring ourselves to a conviction of what should be our foundation verities. A sense of Truth, Freedom, and Beauty may be acquired by all who study with broad mind and with sincerity our mother nature, man, his tools, which are himself, and form the Book of his Machines.

## Modern Scientific Influence

By Dr. R. W. Boyle

I REMEMBER watching in this century, with watch in hand, as the clock ticked out the seconds and the 19th century was gone. Shortly after I witnessed an agent of a new world celebrity, Marconi, demonstrate the transmission of signals wirelessly through the wall of one room to an adjoining one. A few months later Marconi himself, in Newfoundland, received a signal of three dots from across the Atlantic ocean. Only a few years before had come the discovery of X-rays and the making of cheap oxygen by the liquifaction of the air. Radium was discovered within the same few years, and after it the identification of the electron.

In my college days "horseless carriages" were the subject of countless jokes, the commonest cartoon of the magazines representing a "horseless carriage" being towed home by a horse. The submarine was then another novelty and wiseacres shook their heads about its improbable utility. Langley died in 1906, his attempted aeroplane a stranded wreck, and clever young men holding positions as newspaper reporters cracked jokes at "Langley's Folly." It was only in 1909 that Bleriot in his monoplane crossed the English Channel, and in the same year the inhabitants of Cologne peered up into the sky to the excited comment "Zeppelin kommt!" In that same year Peary discovered the North Pole, and not long after Amundsen reached the South.

Only a quarter of a century has passed away and we are able to telegraph wirelessly half-way round the world, and telephone on wires across a continent. Wirelessly we can transmit photographs for hundreds of miles, and a letter can be sent by aeroplane across a continent in a day. An air-ship can sail in comparative comfort, surviving storms, from the middle of Europe to America in about three days. The horseless carriage has become the motor car, an instrument of torture, utility, or pleasure according as the will of man desires. But the increased knowledge of one's own and other countries, the greater breadth of view, the lessons in geography, history, habits, customs and manners, to be induced in travel by the motor car and other agencies, will yet affect a beneficient social revolution.

The travel business now is nothing to what it soon will be. Time was when only the rich could avail themselves of it; now almost all, even the poor, regard it as a right, almost a duty. There are in the present year some hundreds of thousands of people roaming about in the great and magnificent mountains near this city, seeking change, relaxation, health, and wonder. By agencies of travel this century will see every year many millions diverting themselves in this great natural playground of the world.

As for radio, hear the prediction of the president of the Radio Corporation of America:

"Entire written messages, perhaps newspapers, will be flashed as complete documents or pictures. Efficient communication with commercial aircraft will be ready probably before the air-craft are provided. Marine service to-and-fro between ships will even more completely minimise the perils of the deep. Television is not far distant. Static will be chained a captive at the wheels of radio progress. International broadcasting will become a commonplace. The operas of Europe and South America will compete with our own. Entertainment and instruction will penetrate to the remotest corners of the earth. The temple bells of Asia will chime for us, and from the land of old religions will come the philosophies of ancient races. The oldest and newest civilisations will throb together at the same intellectual appeal and to the same artistic emotion."

It has been said, and quite correctly, that we have just passed through a century of electrical discovery. The key that unlocked the revelations of electrical laws was the relating of the old phenomenon of magnetism

to the newly found electric current. Magnetism, which for scores of centuries had remained isolated and undeveloped and was applied only in a compass to guide some wooden ships, was found invariably to accompany electricity in motion. From that, electricity, which a century ago only was amusing, has become a servant of the humblest and of us all. In lighting, heating, locomotive, chemical, and therapeutic applications it is now an ingenious servant almost indispensable. Energy of the sun, which vaporises water and lifts it to the hills to form the waterfalls, is caught, and millions of horsepower from the falls supply their transformed energy for innumerable purposes. Other stored energies of the sun, in coal and oil and gas, have been discovered, and ways and means for their extraction. Their transformation to energies in available forms is now an everyday affair and standard practice. Geographical and scientific search has revealed stores of minerals and other raw materials in the earth, which, refined and combined, form numberless, diverse, commodities which add to the convenience, comfort, variety, and pleasures of our lives.

But the processes of physical and of chemical science never can be confined to the spheres of their own activities—they lend assistance to all other science, and are freely borrowed when and where they are of service. Each department of scientific endeavour reacts upon and stimulates the others. A new discovery in one means a newer discovery in another. The discovery of an unknown parasite on the body of a well-known mosquito makes possible the construction of a Panama canal, when ordinary labour and economic operation had failed. (Will the Western Canadian farmer appreciate that?) The observation of a new phenomenon in physics, when the electric discharge passed through an evacuated tube, means the discovery of the X-rays, which, borrowed by the science of medicine, gives assurance to the physician and surgeon in countless cases where otherwise he would have been in doubt. (If many patients knew what they thereby escape they might be very grateful!) Still another experiment from the same physical phenomenon leads to the fundamental discovery of the atomic nature of electricity; which, borrowed by Engineering, means the wireless vacuum oscillator and the broadcasting of the spoken word or music, for information or for pleasure, to crowded, and, what is more important, to the lonely places of the world.

And so it has come about that many sciences have combined to find the nature of and means to fight the majority of man's harassing diseases. With the knowledge of the existence and action of germs, of what is involved in the complex constitution and circulation of the blood, and of the unsuspected and extraordinary functions of his ductless glands, man may know better than before what conditions of existence and of conduct constitute his best environment. To cure and prevent disease we have received from bio-chemical research the priceless gifts of antisepsis, inoculation, pasteurisation, preventive serums. And if we pause to summarise the main medical advances, in a period extending back not much further than the opening of our century, we stand in wonder at the achievements there displayed. We find ameliorative drugs like thyroxin, adrenalin, salvarsan, and insulin; processes to control and to prevent diphtheria, malaria, yellow fever, typhoid; means to root out tuberculosis, syphilis and leprosy; and promising researches to discover antidotes and cures for old and new poisons and afflictions which beset the race. Medical science is lengthening the average span of life of the average man. There arises then a fine new problem for our political, educational and religious leaders. If we are to have, on the average, more years of life to enjoy, how shall we employ them to put them to their fullest use?

And glance for a moment at the oldest, most sluggish, and most conservative industry of all, viz.: farming, which for so long had been worked with dull and empirical routine. By science agriculture has been stimulated and revivified. What with motors, tractors, reapers, binders; seed selection, soil analysis; control of animal and plant diseases; adaptation of animals and plants to suitable conditions and localities; knowledge of the laws of heredity and breeding—farming may be practised as a learned occupation wherever it will be prosecuted with open-mindedness and brains.

I could go on like this recounting new process after process, new device after device, and discuss their separate influences; but this is not my purpose. It will do just here to summarise it all by saying—we possess today a far more accurate and comprehensive knowledge of earth, sky, animal, and man—and of the laws controlling them, than ever has been vouchsafed to men before.

Let us discuss the present social influences and some probable consequences.

Science and its applications are essentially international, and its influence spreads over all advanced countries almost simultaneously. The findings in one nation are quickly absorbed by others, and only a racial inaptitude for science can prevent the application of scientific practice and ideas. Secretiveness between nations is undesirable, for secrecy is impossible. Moreover secrecy retards progress, in which respect science operates like literature and art.

In the great rejuvenation of the human spirit (the Renaissance) it was Copernicus who took our earth from the centre of our universe and replaced it by the sun. The influence of this humiliation to human pride has not even yet completely been accommodated. Newton reduced the phenomena of the heavens to the operation of ordinary mechanical law. Geological science read the revelations in the rocks. Then Darwin, keyed to this same mode of thought, "took man from his cold pedestal as a fallen angel, and forced him to recognise his kith and kin in St. Francis' little brothers, the animals and birds." The colossal combined effects of these new revelations, in disabusing the minds of men of any sense of specialty in their existence and creation, far transcends the isolated influence of any of them. To the human mind existence and creation became something to be investigated by methods we could understand. And with the knowledge so discovered of the history and origin of things great lights have been thrown on the true process of our life.

Originally a biological hypothesis, Evolution has become a great illuminating and unifying principle throughout the whole realm of knowledge. No branch of human thought can escape the influence of its method, and by it the whole background of our thoughts has been completely changed. Because of its supposed antagonism to religion (which is not at all the case!) "Darwinism" has been assailed; and there is at present a recurrence of antipathy, with some legislative violence, in the intellectually more backward regions of the United States. But apart from this illiberalism, which happily is dying out, the doctrine of Evolution is to-day established more firmly than before.

Biological evolution has been modified by competent researchers, who find that Darwin's theory explains

a part and not the whole of evolutionary selection. Since Darwin's time various new directions of research have thrown additional light on the generation and variation of species. Circumstantial or natural selection is allowed by all to be a great operating cause in determining their modifications and their limits; but natural selection can eliminate only that which lacks survival power, and it cannot be assumed to create those species which are fundamentally diverse. It accounts very well for the *evolution* or *modification* of species, but does not account for their *first* origins. Thus the borders of enquiry have been pushed further back in the great stretch of plant and animal existence.

The earlier theory of Lamarck (1744 - 1829) has come again to the fore. Lamarck, before Darwin, had attempted to trace the cause of modification of species in the cumulative inherited effect of modifications due to influence of environment. This effect on individual structure and character, over a short period of time at least, is small. But Lamarck held that if the necessary changes in habit became continuous and lasting, they would in time modify old organs or call new organs into being. No direct evidence of such inheritance *biologically* has been forthcoming; though it is difficult for some to believe that where the individual can sometimes be influenced so profoundly by environment, the species will forever remain unchanged. (Perhaps it is only necessary to give the process time enough—say scores of thousands of years, instead of a few brief generations, or even a few centuries!)

In Lamarck's theory, it will be observed, place can be found for the operation of *will* as an evolutionary factor. If a member of a species *willed* to acquire the power to do something or to be something, of which he is not now capable, *by trying and continuing to try and making a habit of trying, at the direction of the will,* he might ultimately acquire the power so insistently desired. (This reminds us somehow of Coué ism!) Mr. Bernard Shaw in a similar sense draws on Lamarckism—of course agreeing with it!—in the preface to his play "Back to Methuselah." The much used example of the long neck of the giraffe may be used to illustrate either Darwinian or Lamarckian evolution, and it may also serve very well to illustrate the distinction between the two.

The effect of environment on the individual, and the changes which may be attributed to surrounding circumstances, has had enormous influence on thought and social activity, and is the basis of much of the Philanthropic effort during the last century. A pleasing doctrine arose that we need only improve the acquirements of one transient generation for the next to be innately better, and that the race by mere well-directed philanthropic enterprise would continue to improve in mental and moral worth.

Such ideas lose much power in face of the researches of Weismann on the germ cells. Examining many suggested cases of the inheritance of characters superimposed by environment, Weismann could not substantiate the idea in any one. If the germ cells of one individual are derived by direct descent from those of the parents, how could characters acquired during life affect the germ cells present almost before life began?

Along with the researches of Weismann, we have those of Mendel. The essence of his discoveries, drawn from his researches on the cross-breeding of peas, is that in heredity certain characters or qualities may be considered as individual and apparently unalterable, transmissible units. An organism either has or has not one of such units; their presence or absence will mean a pair of sharply contrasted qualities. A given character carried in a germ cell may tend to dominate, or be a "dominant," or the same character may tend to be subversed or be "recessive." Each germ cell bears either a dominant or a recessive character but not both. Postulating this much, Mendel's laws of continued reproduction follow much the same course as the simple mathematical law of probability would prescribe. Given a mating of known Mendelian characters, we could with fair assurance predict how the character would recur in the succeeding generations. A parent can only transmit a dominant character to the descendants if the parent carries the dominant character in his or her germ cell; but a recessive character may reappear in any generation if two individuals mate, carrying in their germ cells the recessive character, though it may not be outwardly evident in themselves.

The extension of Mendelian research on animals and man has solved many old genetical puzzles. Mendelian characters have been traced in plants and animals, and the method has been successfully applied to unite certain desirable qualities and to exclude others of harmful tendencies. A fine example is Biffen's work on wheat. From a long series of experiments based on Mendelian laws he established new and valuable strains of wheat, in which immunity to rust, high cropping power and certain baking qualities have been brought together in one and the same blend. Some human diseases and mal-formations are now considered to be dominant Mendelian characters; deaf-mutism appears to be a recessive character. Further researches will no doubt disclose other such relations in many other directions. In the majority of cases, of course, the conditions of inheritance are very complicated. Qualities may act as dominants or recessives according to various conditions. They may be linked in pairs, so that one cannot appear without the other; or again some may be incompatible and never occur together. Truly we are complexly and wonderfully made! But the significance of these results is immediately grasped, and their application obvious. Along with Weismann's work they showed that circumstantial selection was not the only word on evolution. They supplement it, but do not exclude it. They also provide one more important method in the search for evolutionary truth. Further additions to this knowledge may be expected in the future to serve as valuable guides to the physician, the sociologist, and the statesman.

So "what is bred in the bone" biological science confirms to be a very important thing, probably the most important factor of all in the determination of *individual and racial quality.* Familiar observations had convinced many of this before ever Weismann or Mendel were heard of. "The past lives on in the present," it is said, and we can now understand something of the reason for the truth in the old wives' tale that "like begets like." We can see why there is generally *biological inertia* in any changes of type from generation to generation, and also why there is sometimes the surprising "reversion to older types." Says Professor Arthur Thomson "We see explained the familiar facts of experience, viz.: that all sorts of constitutional features and qualities, important and trivial, normal and abnormal, physical and mental, *may* be handed on from parent to offspring. . . . There is a fatalism about heredity emphasised by Mendelian research: though notice that *may be* is not the same as *must be.*"

(I have taken some time to discuss these modern offshoots from "Darwinism," for the reason that they were the beginnings of great series of researches pregnant

with immense significance in the future. I could add, of course, other very important results from biochemistry, anatomy, neurology, and physiology, but time will not permit.)

The influences of discovery by the evolutionary method on the social ideas and aspects of our times is a study of never-ending interest. The evolution of early man from ape-like animal forms becomes easily explicable by natural and sexual selection. His social sense and moral qualities evolved from his weakness and defencelessness against his earliest foes (wild beasts and famines). For only by the development of social and moral qualities could he combine for defence and mutual helpfulness, and later develop speech, fashion tools, build up a surplus (wealth), and in the end make of himself a being civilised. Discoveries and excavations have been made whereby the existence of modern (not early) human races have been traced back into years more remote than were thought to be conceivable. Twenty-five or thirty thousand years ago an artistic people—the Cro-magnons—had their artists decorate their caves with likenesses of their hunts and animals. Huxley, stimulated by Darwin's theory, began an exact study of the measurements of human skulls—the beginning of the modern science of bio-metry on which the findings of the modern anthropology so much depend. Excavations have been carried out in all the continents, and skeletons, clothes, furniture, tools and objects of religious worship uncovered, classified and measured. So it is that many of the mental and emotional processes and practices of races of men long gone are unmistakably understood, and we have come to see that history is but the detailed account of human physical and intellectual evolution.

This brings me to the opportunity to express a few remarks about our study of History. No subject of social science has been so lamentably deficient, for in the great majority of books that study of history has dealt with only the political part of man's activities to the omission of almost everything of greater value. These books have been filled with relatively petty things, of changes and successions of kings, diplomatic intrigues, battles, and personal episodes, though these have only little significance in showing us how our present bodies, habits, culture, thoughts, and institutions came about. Happily there is a sign of change, and what was begun in popular or semi-popular fashion by Green, Robinson, Van Loon, Wells and Thomson, will, we hope, be carried on authoritatively by those fully equipped for the task. On account of history in the past limiting itself to political history only, there are very few present day historians competent to write adequately on the history of man. A new race of historians will therefore have to be produced. In the new history we may be sure the history of science will play a large and honourable part. "One who is ignorant of the history of science is ignorant of the struggle by which mankind *has passed* from routine and caprice, from superstitious subjection to nature and from efforts to see it magically—to intellectual self-possession." (John Dewey.)

I should like to see included in our study of history something, very elementary and easy, of the history and stories in the rocks, the evolution of early man, his transformation from a hunter to a tiller of the soil, his domestication of the animals, his coming down to the sea and building ships, his first efforts at trade, his efforts at transportation and communication; the history of his thoughts, and the history of his science and his art. After that I would give a little political history; and where time was wanted for all I have mentioned I am afraid I would rob the last-mentioned to give to its more important forerunners. "When the history of scientific thought and of human movements and ideas is combined with the old history of political action—we shall be able to study better and in all its fulness the great Drama of Humanity." It is to comprehend the great drama of humanity that I see the main purpose of the study of history.

No summary of recent scientific influences would be complete without including a reference to the findings of psychology. Experimental psychology and comparative psychology, the study of the minds of different races of men and animals, are among the newest born of scientific studies. I know that in spite of the great flair it is now enjoying psychology has not yet become exactly a science, rather it is in the position of a pseudo-science, whose followers are many and competent researchers few. Fakirs have entered this new field in an attempt to filch money from the gullible. But we should be impressed with the well authenticated results psychology has thus far disclosed. Experimental demonstrations can be made, with valuable if not always with exact accuracy and interpretation, of such things as the acuteness of the senses, and the influence on them of injury, fatigue, and other changes. We can measure the power of memory, and the effect of association of ideas on memory and on action. Psychology could not advance far if it could take no measurements and supply no quantitative information. More and more in certain ways we shall be able to regard man as a measurable being. Psychological findings so far find him to be "a strange, interesting, contradictory, childish and noble creature, instead of the simple, rational, static being, which old-fashioned philanthropy, religion, political economy and political science had thought that he ought to be!" "The political economy of man," says Professor Mitchell, the economist, "will assume a new character; it will cease to be a system of pecuniary logic, a mechanical study of static equilibria under non-existent conditions, and become a *science of human behaviour.*"

Through the methods of psychology the phenomena of trance, hypnotism, suggestion and multiple personality are being submitted to scientific investigation. They throw light on both normal and abnormal mental and nervous processes, and some of such researches intimately connect themselves with the phenomena studied under "psychical research." There are people, as you know, who believe in the continued existence of the spirits of the dead, and of the possibility of intercourse, though disconnected, between these spirits and ourselves. A few men of eminence, well known and even celebrated for various activities, have subscribed to this belief. Without barring my mind to any reasonable conclusion on this subject, I cannot report that I know of any evidence from past or present experiments which I should consider worthy to establish a reasonable conviction.

We realise, however, the importance of sub-liminal mental processes, which help us to understand in a new way many phases of human society and life. Our social, political and religious actions are profoundly affected by both conscious and sub-conscious association of complex ideas and emotions. When we discover the psychologically complicated structure of the human mind, and envisage the sub-human and savage, as well as civilised, impressions which have borne upon it, we find the reason why political art and theory have not worked in practice as former political science expected

and hoped that they would do. The political theories of the 18th century, which underlie most of our political practices to-day, were based on the ideal conception that man was a reasonable being and could govern himself and others in the calm, clear, light of reason. In theory the democratic citizens would follow the actions of his country's government with unflagging attention; would study its political questions with concern, read Parliamentary speeches, and when elections came would solemnly and calmly decide and vote "holding the torch of Reason in his hand!" To-day we know the difference—and the reasons! A scientific, psychological examination of the facts has shown that man is not, and never has been governed by reason. This may be unfortunate, but it is true! The number of things about which we, even the best of us, consciously reason is few. (In fact, it has been said that the advance of civilisation can be measured by the number of things we do not need consciously to reason over!) Hence into practical politics there enter strange psychological phenomena; phenomena for example, of individual and mob passion, and of mob propaganda. Public opinion, through rhetorical addresses or the press, can be manufactured, and is manufactured, with no regard for reason. Recourse can be made to personal or class appeal, or to local or religious prejudices; corruption is still practicable, and intimidation though insidious still persists. And I am afraid it is only simple truth that democratic countries in these respects are not much better than the supposedly "undemocratic"—a fact we need not greatly wonder at when we understand the complex psychological inheritance of the human mind.

With the background of the science which I have so cursorily sketched for you to-day—it is interesting and profitable to attempt to look into the future. It is certain there will be new political orders in the world in the coming years. Events in proof of this are happening in all parts of Europe and of Asia. The old political men—and the old types of men—are passing off the stages of the world's affairs. New political parties are springing into existence. In some of the nations of Europe a modified dictatorship, for the time being at least, is replacing government by representative democracy. The fatal failure of democracy thus far, lies in the fact that the mass of people positively will not take interest in their own political affairs. They are jealous of the liberties and rights which democracy may bring, but not its responsibilities and discipline. It may be that within a generation or two a socialistic order may supervene; which will be tyrannical or just according to the enlightenment of the people. After that—who knows? But one thing is certain—an order that is not dominated by trained directive mind, sound knowledge, and honest character, will not survive. The histories of absolute monarchies, landed aristocracies, state churches, guilds, and soviets, have proven fully that no one social or vocational class has the capacity indefinitely to govern all the other classes. Give any class unrestricted power and it straightway begins its own degeneration. Any political order which revolts man's ethical sense, or subjugates his sense of freedom, in the long run cannot persist.

I wish to apply the principles of some of the processes I have discussed to a great Canadian political problem, which all of us, since we are interested in the future prosperity and destiny of our country, must study and observe with increasing, serious, concern. The problem will be all the better understood if we divest our minds of the policies and prejudices of political parties, and approach it only by the methods of the student of biological and economic science.

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will depend not only on our own efforts by hand and brain, but will inevitably be dependent upon the growth of population in the United States. There are there now 118 millions of people, and in spite of restricted immigration, the population is growing at the rate of 1.6 millions every year, *i.e.* a present population of Canada every half-dozen years. Simultaneously with this growth of population is the tale of the diminution of supply of food in excess of their own needs and available for export.

The saturation point of a country's population will depend upon the social level of existence, the physical, ethical and esthetic standards it accepts of life. Statisticians and biologists are now in a position to calculate approximately that *to maintain anything like the present standards of existence* in the United States their population *should not be permitted to rise above about 200 to 220 millions,* unless totally new means of sustenance be discovered. With the present standards of farming the United States could support only about 170 millions; we make allowance therefore for possible increased efficiency. But even allowing for their methods to improve, and for more land to be reclaimed, the statements we sometimes read such as "the state of Texas alone could support the present population of the world," and the statement some years ago by Mr. Lloyd George that "Canada will sometime in the future support a population of 600 millions"—seem to be absurd, and to emanate from men who simply do not know.

It can be calculated that at a rate of increase even something like the present, the population of the United States will reach about 180 millions by about 1980. This date is only about 50 years hence—that is, very many of your school pupils will see it. Generally if population rises too rapidly so that the standards of existence tend to fall, prevention of further increase will ensue either by natural or rational selection:. The figures just quoted, therefore, allow for some slowing down.

Now the point of all this, which bears so insistently on our Canadian economic and political future, is that the United States is approaching the point of inability to raise all the food that it requires, a condition that will be intensified if the country continues to develop, as it promises, as an industrial country exporting manufactured goods to other countries of the world. The inference is obvious; the United States will have to import food; and this is the great looming economic change on this continent which has caught the attention of that much interested and interesting personality, the President of the United States, as well as many other economic and financial thinkers. From what regions can this imported food arrive? We cannot see what can stop the soil of the Canadian prairies from becoming, in good part, the provider of food in meats and grains to the great industrial populations of the United States. Our greatest markets will not be in Europe as at present, but in the great populous industrial centres to the south. The same process has gone on in connection with our wood-pulp, and the signs are that it eventually will supervene in metals. It looks as though the great trade routes must be North and South, as Nature has ordained, though they are not that way to-day, and this expectation often has been refuted.

But to-day we see the sign of what in later years nature will impose. There is now a trickle to the United States of food in spite of high tariff walls against it; but in twenty or thirty years the trickle will have become a flood which no tariffs can withstand.

With the demand from the United States for food (and there is no impeller in history like a hungry stomach!) there will come the American demand for lower tariffs on it. Our cars carrying grain and meat will return filled with southern products and manufactured goods, to pay our bill for food; for a country pays for what it buys not in money but by the goods it can exchange. (Let us forget money in these processes, it only *confuses thought!*) With the coming north of great quantities of manufactured goods, there must arise on our part the complementary call for lower tariffs on them, a condition we see already intensifying in this West. Some of the processes I have here delineated will be operative also in the eastern Canadian provinces by the Atlantic.

Inevitably the serious question springs to mind, what will all this mean to the future of Canada as a political entity? The answer cannot be surmised; but I ask you to consider this great problem of the immediate future with serious concern. Your school pupils, and such as they, will be the ones to settle it! With the rising production from the Canadian prairies will come the rise of prairie population, and nature will oblige this population, either by or against their racial desires, to demand a freer and less obstructed trade. Now here will be a set of economic relations which may not be consistent or in harmony with those desired by the populations of mid-Canada, where nature may rightly require quite another set of economic laws. If at the critical time the population of prairie Canada will be numerous enough to hold a dominant power of votes in the Dominion, trouble may be averted simply by a veering of national political policy; but if the voting power, though increased, will be a minority still, there may be such conflict between mid-Canada and west, that consequences not very pleasant to contemplate may ensue. I do believe there exists in the conditions which nature imposes on us in Canada to-day, which we had no part in occasioning beyond the bare necessity to live, a latent danger to this Canadian Federation. The composing of these economic conflicts and consequent political incompatibilities will be, I believe, the coming great concern of thoughtful Canadians, and of Canadian Statesmanship. As a scientific man, examining such tendencies in a scientific way, and being unconcerned about this or that political party or this or that political personality, I cannot see that the issues I have here referred to can be stifled, winked at, or avoided. They cannot be settled by slogans, banquets, or patriotic speeches, but only by love of country, sound knowledge, and serious thought. And there is no harm in invoking, in the settlements of our future, the characteristic and inherited instinct of the British genius of compromise.

Two other important factors, operating in the determination of the Canadian future I shall ask you to contemplate: (1) The amount of American capital now invested in Canada amounts to about 3,000 millions of dollars, an amount greatly in excess of our whole national debt; (2) The population of the prairie provinces will augment greatly, mostly to raise raw materials and food. What peoples will be amongst them? Of what racial elements will our population be composed? And if there will be one predominant element "to leaven the whole lump" from what racial stock will it be derived?

It is impossible now to visualise what life will be like in a time even as near as the 21st century, which is only three generations hence. The physical and chemical improvements, discoveries, and inventions will continue; so also will the discoveries of medicine and biology. "Possibly the time is going by when we can

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depend much upon accidental or consequential discovery by the genius in the garret. A host of men, great equipment, long patient experiment to build up the structure of knowledge, not stone by stone, but grain by grain, are to-day the fundamental source of invention and discovery."—(Herbert Hoover.) This can only be possible by strong financial support from state and private funds.

It will probably be the case that the most important applications in sociology before the present century is out will be from the sciences of biology. From biochemistry may be expected to come new discoveries and ideas, like the theory of *Lormones*, whereby many unfortunates may be enabled in good measure to *correct their natal deformities and incapacities.* The idea may now be dawning, which has hitherto been thought impossible, that it may not altogether be outside of human power in the future to modify the human body's form, or change perceptibly human qualities and character.

A new unfilled country like Canada has not yet reached the point of feeling pressing social stresses due to overcrowded populations as in Europe and most parts of Asia; and I hope the day will never come. Says Sir Aukland Geddes: "In Europe we know that an Age is dying. The thought that masses are born to the mere struggle for existence, to bear children and die, leaving in turn myriads to go again through the weary treadmill of toil and suffering, has seized the imaginations of millions."

Only two main causes determine the point of surfeit of a country's population: (1) the work that can be done in raising food or in the making of commodities in exchange for food, and (2) the desired standard of existence. The point of surfeit having been attained, natural or conscious processes will surely supervene to limit further numerical addition. If the standard of existence is to be maintained, and the saturation point of population has been reached, a throw-off of the surplus must ensue. This takes place by emigration, either peacefully or warlike; or by the naturally selective processes of diseases, famines, wars; or by rational selection, ante birth. In the future when great pressing national and inter-national problems must be faced, of the regulation of the growth and quality of population in a crowding world, we may safely predict that the theories of Lamarck, Darwin, Weismann and Mendel, or such portions of them and their consequent discoveries as will have been proven valid, will sink into the common stock-in-trade of popular knowledge. We may be certain that much legislation will be based upon them, preceded let us hope by a sound education of them. Such knowledge will help to guide the choices which will of necessity have to be made—the choices possible for population regulation, namely, that between natural and conscious rational selection.

I have discussed the views and influences of modern thought induced by Science on the great social departments of History, Politics, and Sociology. I could go on similarly to discuss their effects on Literature and Art. Of education I have said enough in my other addresses to this Convention. But I should like to add that I think the cultivation of science tends to promote a type of culture that is democratic, inclusive and sympathetic, rather than exclusive, aristocratic, and austere. The great scientific discoveries have been drawn from all ranks of society, as even a cursory biographical examination will show. Watt was the son of a shipbuilder, Smith and Newton of farmers, Dalton of a weaver, Faraday of a blacksmith, and Pasteur of a tanner. Joule was a brewer, Davy a druggist, and Franklin a printer. Aristocratic ranks are represented by LaPlace, Cavendish, Maxwell, and Lavoisier. Similarly we could find instances of the affiliations of scientific men to all beliefs of religion. There are the pagan Aristotle; Roman Catholics, Pascal and Pasteur; the Anglican, Darwin; Calvinist, Faraday; Unitarian, Priestley; Quaker, Lister; and Agnostic, Huxley. In such men the ability to dominate over fellow creatures was subdued to curiosity and love of nature, and to persevering work.

In this address I have, in the name of science, dared to look at great problems of the future. It is often useful so to do. Not that we are always right—usually we are partly right and partly wrong. Science is the accumulation and organisation of experience and common (or uncommon?) sense. It is useful in the light of science and experience to look forward at great problems for "experience is an arch where through there gleams *that untrodden world.*"

## Teachers and Authority 2.

Wm. Cameron, M.A., Lomond

Too often do we hear in conventions convoked under authority, discussions on the pedagogical aspects of various subjects prescribed for school instruction. Their fitness is taken for granted because approved of by professional wisdom. Too seldom do we listen to any enquiry dealing with the suitability of these subjects as preparatory material for the proper training and future welfare of the child. A discussion of this nature conflicts with authority. It seems most important, too, for the teacher to know his position in society; otherwise his actions are inconsistent and internally contradictory. Yet, never do strictly teachers' meetings concern themselves seriously with this question.

It is taken for granted that they possess membership in the great oscillating middle class. But this polite Bourgeoisie also reverences authority and refuses to assist the teacher in any opposition thereto. The ostentatious though purposeful tolerance and friendship its condescension bestows are altogether hypocritical. It even barely conceals its scorn at his futile endeavors to mitigate oppression and improve his social status. It ridicules his mental attainments and ostracises him from participation in the more important activities of modern life. But repeated impluses of this nature finally affect the teachers' outlook. Then begins the great schismatic drift. Even now, already, the more intellectual among them evince a mistrust of authority in the realization that their greatest support comes, not from above, but from the "despised and rejected," self-conscious working class. This, because of an identity of interests. And the common bond continuously urges the majority to instinctively strengthen this relationship; even although they do not generally understand the driving force that will eventually compel their mutual co-operation and solidarity.

All this, because education believes in arbitrary authoritative judgment. Unlike science, it possesses no unit of comparison for self-measurement. So by means of intuitive conviction it issues edicts that popularly possess the force of absolute law. It can dig mental post-holes and by external methods measure their depth and volume. But self-examination, no! Such an unprecedented innovation might lower the authority of dignified solons and reduce them to the level of the vulgar crowd. Teachers have never possessed the temerity to suggest the necessity of such a fundament. They can advance no reasonable argument detrimental to authority. And so with a perverted vision, all their

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judgments in so far as education is concerned, are purely subjective and according to individual whim and humor. Which explains the multiplicity of educational curricula, and the reason why the teacher body has failed, thus far, to orient itself in modern social life.

But science has no respect for individual authority, not even for tradition. Science has found a basic standard for measuring the efficacy of any educational system. Education, on the other hand while pretending to be scientific, displays no interest in the ethics and practice of science. They still rely on the unreasoning might of authority. They point to the fact that curricula of High schools include such subjects as physics and chemistry; but, in truth, these only serve to partially fill up the vacant intellectual post-holes dug by the fairies at an earlier stage. The combination annot result otherwise than in mental chaos. From a cruly educational point of view, the net social result ts nil. Science defines education as an activity tending itoward the progressive development of mankind. The definition is not true because science says so; science says it because it is true. How it arrives at this understanding is at present beside the point. Learning thus appears not as an end in itself but as a means to an end.

In thus functioning education exhibits two definite phases of activity. Between them, no distinct line of demarcation exists. The change takes place so slowly and imperceptibly that the previous stage merges into the subsequent in such a way as to render it difficult to indicate where one ends and the other begins. For this reason individuals are carried well into the second stage without being cognizant of the change, nor able to account for the contradictory conditions then arising.

In its first phase education naturally fulfils its function and acts as a means, though seemingly indirect, of bringing about a satisfaction of the demands of industrial life. The content of education originally coincides with the interests of society. At this period the whole social fabric gives support and encouragement to education which, on its part, reacts beneficially for humanity. All educational activities flow on rhythmically and harmoniously. Co-operation exists between society and its functional part. Rapid progress results. The teacher performs a positive work and his relations accord with other institutions. In fact at this definite stage, society looks upon him as a superman, because there still exists the anthropological tradition (see School History and Literature) attributing full credit for increasing prosperity to the personal exertions of a particular individual called the "Great Man."

This person appeared to benefit mankind by his prowess alone, whereas his genius lay not so much in his own independent solitary exertions, as in his ability to correctly interpret the social wants of mankind and devise a course of united action to fulfil these requirements. Such a procedure apparently indicates the dominance of mind over matter, over society, and gives rise to many false and childish conceptions. But, no! matter controls mind; blindly, it may be. Matter is the primary cause of mind, which, on the other hand, assists matter by consistently directing it along paths leading to more rapid growth and development. Man, thus, becomes an important link in the great chain of natural and social evolutionary progress. At the same time mind cannot be successful in its directive efforts, unless it consciously observes and acts strictly in accordance with the general material and social laws. The same truth holds good in a more limited sphere for educational affairs. The content of education, agreeably to its scientific concept and definition, must be regulated, not by pure mental professorial idealism, but by the changing requirements of the human race.

For human wants change. Once mankind has attained satisfaction of his immediate desires, others straightway arise. Continuity of this process makes progress. The content of education must change accordingly. To function properly education must aid in overcoming new dominant problems. Professorial authorities do not, however, understand the cause and necessity for a definite change. They still hold the opinion that the "great" mind controls m.tter and society. As a consequence they assume that any rationalist scheme should function even in opposition to natural laws. Mind can form arbitrary ideas, apparently adaptable to a definite situation; but these personal plans fail and must continue to fail because not conforming with experience. They won't work; work is the supreme test. To aid in social progress the content of education must conform not to the authoritative dictum of instructive professional wisdom but to recognized laws established scientifically through experience and the faculty of reason.

When peace prevails, social institutions co-operate harmoniously for the human welfare. Contrariwise, conflict means discord, a lack of co-ordination between the whole and its parts. It indicates, generally, a lack of progressive development due to educational efforts, misdirected through failure to understand the main objective. This, the second phase has now appeared in education. Conflicts arise. So imperceptibly has the change taken place that the boundary line of the previous stage has long passed without notice. The content of education, instead of aiding, now hinders further development. Opposition grows in intensity with passing years. From an era of peace we now enter a time of strife. No reasonable argument is advanced to account for the change as education is measured by traditional memories. But contradictions must be solved and retained in a higher form; education must again play its functional part. In the meantime the breach widens. Reforms arise to bridge the chasm; all to no purpose. Educators, not understanding the situation, have so far failed to find a satisfactory solution. Authority is bankrupt. Society at large combats education and reduces revenues for its efficient organization and working. Internal differences spring up within the educational body itself in adjusting which the weak will be sacrificed in the interests of the strong. This stage already manifests itself. It marks the commencement of a long struggle between groups and finally individuals for self-preservation. Even the teachers—the real workers and for that reason considered the lowliest instruments—already find their interests being swept aside by high authority.

In despair at not being able individually to prevail against their slow extinction as relatively free and independent entities, teachers unite their forces under the A.T.A. But numbers alone do not win battles; organization and understanding, the practical and the theoretical, must occupy outstanding positions. These the membership in general do not possess. So long as the Alliance, representative of teacher thought, recognizes, palliates and supports the present form of education as authoritative, practical and efficient, no valid reason exists why it should countenance the system on the one hand and oppose it on the other. From the viewpoint of conservatism and tradition, all present educational activities are good, logical, and deserving of encouragement. If, then, teachers are "antiques" there is no ground for any substantial argument. From the viewpoint of science and progress,

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these activities but retard and hinder social development, and so appear as altogether wrong. Teachers have the choice of two things, as the poles, diametrically opposed. If opposition, must needs be, let it be wholehearted. The world has no use for neutrals. They help obstruction. They form part of the great oscillating mass, historical renegades, who respond to the beck of one side or another according as their individual immediate interests are affected thereby.

The oscillation, at present, is not sympathetic to the teacher movement. The sacrificial rites begin. Even now subsidiary organizations have arisen within the educational body for this purpose and under various guises and pretexts, function in attacking through a policy of cultured frightfulness, the individual and the small group instead of the mass. Do not imagine these things just happened. They are authoritatively purposeful and deliberate. Teachers also oppose their fellows and education cwing to its dualist nature gives encouragement to this course of action, for the purpose of splitting organization into small weak groups. At no other time has there been greater need for solidarity. "Bootleggers," stool-pigeons, teacher-smashing bodies—though their activities are subterranean, no one should have any difficulty in following their malodorous trail. That they have the support of the parent body is manifest. For no hostility exists among them. The same form of espionage and oppression, due to the desire of authority to perpetuate its life, exists in Canada and in the United States, not only against teachers and their unions but also against every form of labor organization. Solidarity along with persistent reasonable opposition, is the only antidote.

Even as a united body, teachers do not possess sufficient strength and economic resources to wage a continuous combat against a financially well equipped opposing organization. They have procrastinated too long, holding aloof from other labor bodies and endeavoring to negotiate a shilly-shally form of co-operation with an inimical authority. Their position is thus weakened. It is time for them to recognize their struggle as part of the universal fight, now taking place between the two well-defined classes in society. They must reasonably make this admission and decide definitely to act on one side or the other. Their place lies alongside those that sympathize with them and actually support them—the great army of the working class, the future saviors of mankind.

But in this common struggle combatants must have a definite aim; must understand the final objective of their labors. While it may be necessary to tilt occasionally against windmills, it must never be forgotten that the ultimate cause of all contradictions existing today in education, is the content of the system itself. Reductions in salary, insecurity of tenure and other ills, attributed directly to individuals and governments, in reality reflect a definite stage in the workings of an institution acting in opposition to social welfare. Internal reforms, while perhaps temporarily ameliorating some ills, but cause numerous others to spring into existence. The whole content of education must be changed. The concrete substance of education consists of the sum total of its attributes. And as surely as we exhaust a heap of sand by scattering it, just as surely do we remove all the substance of an organism when we take away its attributes one after another.

## Duh School Meeting

Now ev'ry body stop duh drink,
We gotta make duh business talk.
Now ev'ry body lotsa tink—
(Sam, put it in dat cork.)

Duh teacher askin' for duh well,
We tell heem, "Lots a rain,
And creek heem only half a mile";
Dat man geeve us dah pain.

Heem say no gottum janitor.
What is it dat? What cost?
May be he want to foolit us,
May be he some ting lost.

We nothing cuttum wheeskers off;
Heem ask for cuttum wheeskers glass.
Heem crazy. Better wheesker grow.
Dem plenty good for scare duh class.

An' now he askin' for duh wood.
We geeven heem de saw,
And when he burnum what heem cut
Den heem best cut some more.

Sam, go get out duh register;
Heem not teach right, me tink.
Look! how he lotsa make mistake;
I tink maybe he drink.

Mine boy been fi—seex year to school,
He don't got A.B.C.
If teacher heem been teaching goot
Heem know as much as me.

He tellin' Mike, "Trustee no goot,"
I t'inkso! heem too big got mout!
Dat teacher too big trouble make,
Don't you tink, boys, kick heem out?

Our secretary ask too much,
He gettin' forty dollar;
Me tinkso I, me take dat job,
Me plenty lotsa scholar.

Duh gover'ment heem lotsa write,
Heem say no readum letter;
Say boys you geeven me duh job,
I tinkso doum better.

Heem too much try collect duh tax,
Heem know we no got money;
Heem say "got pay dat teacher man."
By gosh! Dat joke am funny.

Now Sam you gettum out report,
And tell what meester 'specter say.
What you tellum? What? You no can read?
Geeve me heem. Get away.

Uh-unhm—grade twelve, what gottum here?
Just gottum here grade two.
Uhnm-pu-pils-ap-par-a-tuv—huh?
This writin' Frensz—me no can do!

Hey Sam, go gettum teacher here,
We ask heem "Please explain,"
We no got lotsa read and write,
Heem got goot, make um plain!

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